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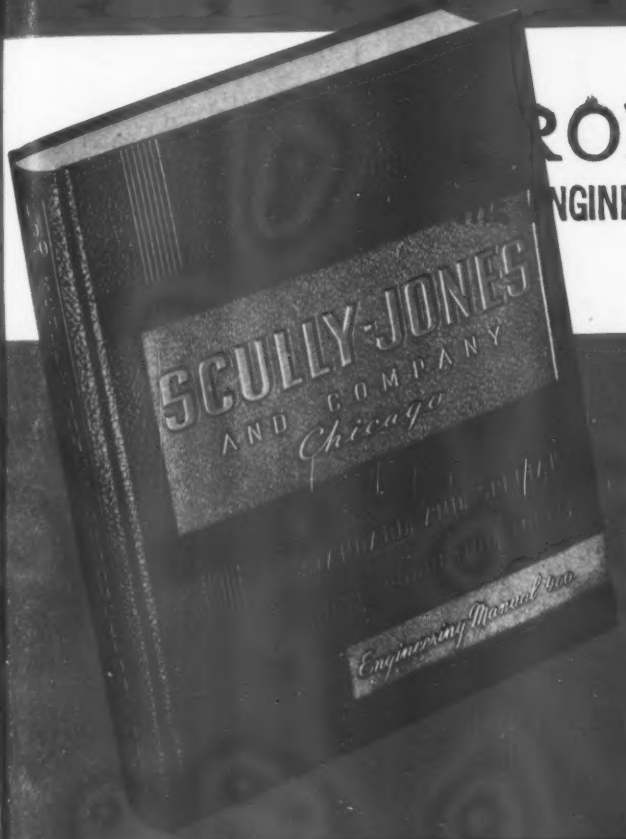

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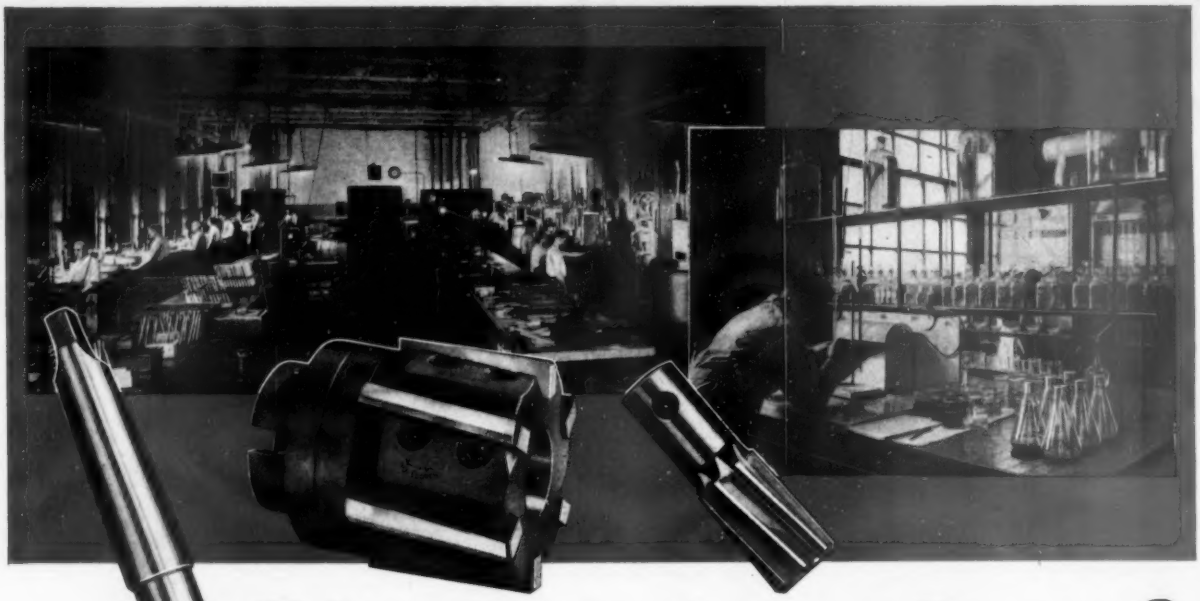

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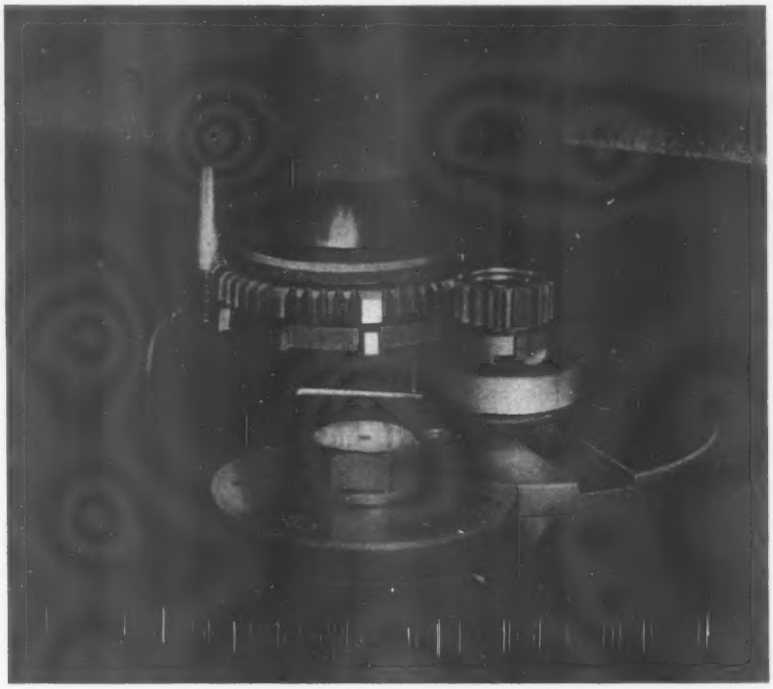

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Vol. VII JULY, 1938 No. 3

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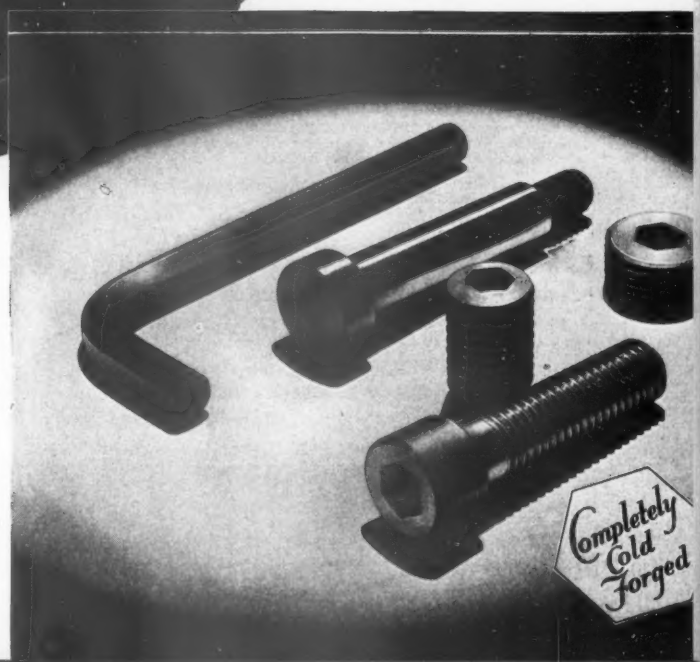

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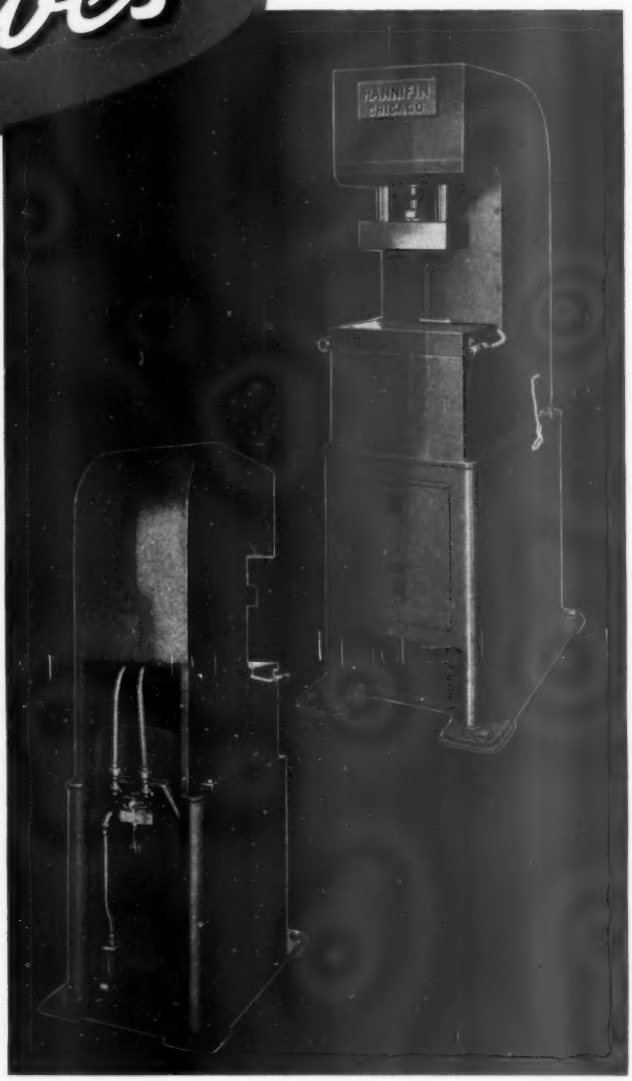

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"HY-POWER" CYCLE: The exclusive "Hy-Power" hydraulic operation provides an automatically completed press cycle when the push button control is pressed. This cycle includes: 1. Rapid advance until the die touches the work, 2. Automatic high pressure working stroke, 3. Automatic reversal at maximum pressure, 4. Rapid return to starting position. The oil pump idles at zero pressure between cycles.

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ACTION — NOT WORDS

AN EDITORIAL

By A. E. RYLANDER.

NOTHING is so futile as criticism without constructive alternative, unless it is throwing bricks over a wall, then, the job done, tossing them back again. That, to a large extent, is what our public works projects amount to. There is little of permanence—if anything can be permanent in a progressive society—and work performed as an alternative to dole is costly to everybody unless there is some return. Now, despite high hopes that the "recession" will be turned, we may face curtailed production with more unemployment. In the interim, constructive plans for both industrial and relief employment can be advanced if the brains of the nation are turned into that channel.

As engineers, we can consolidate for a fight against a moratorium on technological advance, since a bill to effect such a moratorium will likely be presented. We may as well face the facts. Should industry, by some miracle, go on full production tomorrow, it is doubtful if 75% of those now idle will ever be reemployed; they'll be idle until new industries are created to absorb them, or a quickening market creates a demand above normal. Shortened hours and rising costs have spurred invention; we can now produce more, with less man effort, than we could three years ago. But, to call a halt on mechanical improvement would only aggravate the situation, since trained and skilled men, now bearing a large burden in the support of the idle, would be unemployed with the rest, would create more idleness.

Training and brains are liabilities unless employed to useful ends, but in times of depression both can be employed in plans for the future. And after all, engineers contribute largely to the shaping of civilizations; having shaped, we have to lie in the bed we've made. Let's make it comfortable.

Now, then, what can we do? Well, we create tools for mass production of commodities that other engineers have developed. As automobiles, for example. Automobiles have to run on roads, and most of our roads are utterly inadequate to meet the demands of automotive traffic. Detroiters, for instance, remember the snail-crawl from the lakes on week ends, but now we have super highways—and we still crawl. We need safe, high speed traffic lanes, engineered for speeds over 100 m.p.h., arteries to remote points as well as for traversing congested city areas.

Such speedways would spur buying of new, fast cars, would create employment in the automotive industry. The construction of the roads would create employment in cement and steel mills, in cotton production, among quarrymen, among producers of road building equipment, in diverse lines; would employ a legion of relief workers at gainful work. In that line alone, it would eliminate relief employment. Now, all this may seem obvious enough, but, we're not doing a darned thing about it except talk. What about a committee composed of delegates from various engineering societies, dedicated to promoting employment? What body of men is so eminently qualified to take the lead, to project workable plans?

The writer has hit the high spots; needless to say, a committee of engineers could draw on the best brains in the profession, could coordinate all of the initiative, inventiveness and enthusiasm that make engineers what they are, prime movers. Now, let us quit talking about depressions, let us quit criticising relief workers—"for there, but for the grace of God, were I"—and, like big brothers, evolve means for employment at work at which a man can keep his self respect and, incidentally, carry his share of the load in the nation's commerce. If we can do these things—and we can if we will!—we will have accomplished a fine job.

Study this Unusual Set-up of DAVIS BORING TOOLS

Photo shows specially-designed Davis Tools used to rough and finish bore sizes 6⅝", 7⅝", 8⅝", and 9" A. P. I. Drill Pipe and Casing Couplings.

A two-spindle Taylor & Wilson machine is used. The bars, mounted in a vertical position, are piloted in bushings located below the pot chucks used for clamping the work. The revolving table has four stations, two for loading and two for machining.

The couplings are bored at 20 R.P.M. ⅛" feed with a production of 10 couplings per hour.

IN this interesting set-up, couplings are rough and finish taper bored for threading, counterbored and faced, and chamfered on the O. D., in the same operation!

The special Davis tools are designed with separate cutters for each operation: two fly cutters to rough bore thread diameter; one set of 4 cutters to finish taper bore thread diameter; one set of 4 cutters to counterbore, chamfer and face end; and one cutter to chamfer O. D. All cutters are separately adjustable to compensate for wear and regrinding.

The outstanding features of the set-up are: (1) The heavy, rugged construction of the Davis Tools, with cutters separately adjustable for each operation, and with replaceable pilots; (2) The vertical type set-up, which helps to much more readily remove the chips from the work.

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DAVIS BORING TOOLS

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Centerless INTERNAL GRINDING

Probably the most advanced step that has been made in internal grinding during the last few years has been centerless internal grinding. External centerless grinding has been an accepted operation for a considerable period but the adoption of internal centerless grinding is still new to a great many mechanics.

By L. A. HASTINGS
HEALD MACHINE CO.
WORCESTER, MASSACHUSETTS

THE PRINCIPLE OF INTERNAL centerless is that it utilizes the outside diameter of the work as a path for grinding the bore. Thus, the finished hole is concentric with the outside diameter and a uniform wall thickness is obtained. It also makes possible completely automatic loading and unloading of the work, the operator merely having to keep a magazine chute filled with unfinished parts. Furthermore, when two or more grinding operations must be performed on the same part as, for instance, roughing and finishing, the work can be rechucked in the same location as often as required. This method lends itself to straight and taper bored, interrupted and blind holes.

The machine shown in Figure 1 can be arranged to size either Gage-Matically or Size-Matically, depending on the character of the work to be finished.

Referring to Figure 2, the work rests on supporting roll (A) and is held in contact with regulating roll (B) by pressure roll (C). Roll (B) revolving the work at the same time prevents it from acquiring too great a speed in its contact with the rapidly revolving grinding wheel.

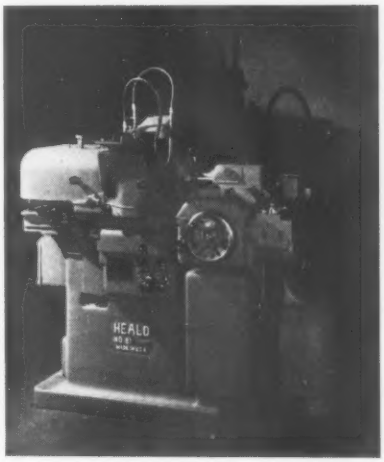

Figure 1. Heald internal centerless grinder.

When parts less than 1¼" outside diameter are ground a solid blade is used in place of the supporting roll (A). Pressure roll (C) is mounted on a bracket that swings back out of the way during the loading and unloading. When the grinding wheel (D) enters the part it bears against the inner surface of the work directly in line with its point of contact with the regulating roll.

Contrary to the usual grinding practice the wheel and the work rotate in the same direction. The complete work unit is mounted on a table that travels back and forth longitudinally on the bed carrying the work to and from the grinding wheel. When the bore is finished the wheel automatically withdraws from the work which is automatically ejected over the regulating roll (B) by loading arm (E). Refer to Figure 2. As loading arm (E) returns to position it brings with it a new piece of work to be ground which falls into position and is ready for grinding.

Figure 2 shows a straight open bore in a roller bearing race. The centerless machine will also handle taper holes by swivelling the roll unit. The work is held endwise by a backing plate and the bore is sized by the Size-Matic method. Another open straight hole job is large chain rolls. Where the chain roll is of small diameter a blade is used for support as shown in Figure 3.

(Continued on page 28)

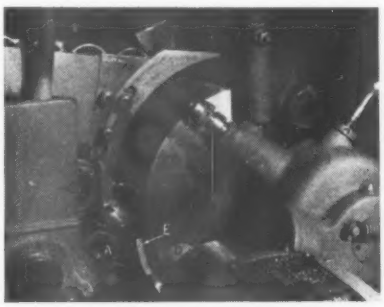

Figure 2. Start of loading cycle showing rolls on Heald No. 81 Gage-Matic Internal Centerless Grinder.

Figure 3. Centerless grinding chain roll pin for Baldwin-Duckworth Chain Co.

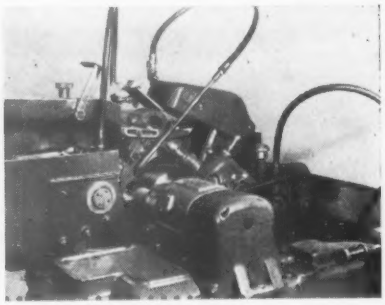

Figure 4. Centerless internally grinding eleven Aetna thrust bearings at a load. O. D. varies .003 corrected in Bore Diam. to .001.

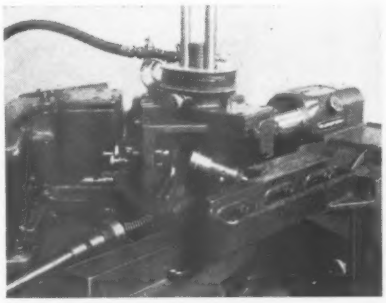

Figure 5. Close up of left hand view of roll unit for Thompson Products.

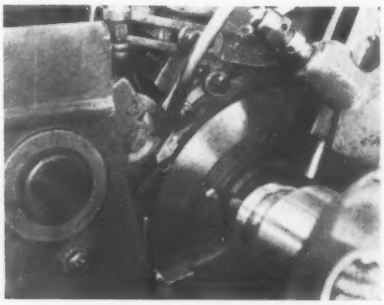

Figure 6. Internal Centerless grinding a roll with a hole .3574" diam. for United American Bosch.

Figure 7. Front view of Workhead on Heald Style No. 73 centerless internal grinding machine built for Bristol Airplane Works, England.

DEVELOPMENT of the *Superfinisher* for CRANKSHAFT BEARINGS

By EDWARD C. LEE
Member A.S.T.E.
CHIEF TOOL DESIGNER
CHRYSLER CORP.

TODAY we see in use many new machines employing new processes for performing the widely varied operations that are associated with automotive manufacturing.

Great progress has been made in the last few years in most branches of manufacturing. Welding equipment has been notably improved. Automatic equipment has been developed for practically every machining operation, such as drilling, reaming, boring, tapping, milling, grinding, etc. Broaching has made great strides and today parts are finished by surface broaching that were unheard of a few years ago.

But with all this improvement, there was one branch of machining that remained dormant as far as new development was concerned and this was the art of surface finishing. This is the final finishing operation performed on a surface whether external or internal before assembly into a completed unit.

It is apparent now that one of the principal reasons for this non-development of new methods and machines for surface finishing was the lack of any suitable means of surface valuation, or of being able to assign a numerical value to a certain degree of surface roughness.

To those who may not be familiar with the history of surface finish as relating to tapered roller bearings, a brief resume showing how future developments had their inception from the solution of the difficulties that confronted manufacturers at that time.

An Interesting Case

Bearings that would last the life of a car would not withstand shipment by railroad over long distances. Something happened to them in transit that caused them to be noisy. All clues were investigated and finally the cause was found. The bearing races were brinelling. The constant vibrating action of the freight car caused the tapered rolls to form an indentation in the bearing race. This condition is shown by microphotograph, Fig. No. 1.

These brinelled marks were not deep only the surface finish was broken through and there it ceased. Why, we did not know, but the corporation decided to find the reason and under the direction of Mr. D. A. Wallace, president of the Chrysler Jefferson Division, research work was started.

Different methods of producing surface finish was tried out with varying results. Ultimately a process was developed that produced a surface finish which appeared much better than anything hitherto produced, but how much better no one could say definitely. It all depended on individual opinion and we all know how that varies.

Figure 1

In the search of some means to check the new surface finish attention was drawn to the development of a surface measuring instrument by Prof. E. J. Abbot of Ann Arbor which was called a Profilometer. Only two of these were in existence and they were designed for use in the labora.ory and were not suitable for production. We wanted something that could be used in measuring all kinds of car parts from the crankshaft bearings to the crowned head of the valve tappet, regardless of the shape of the surface that had to be measured.

These specifications were fulfilled in a portable Profilometer that could be used on all shapes of surfaces. The unit of measurement being the micro-inch which is equal to one millionth of an inch, we now had a measuring stick for the smoothness of surface finish.

The first application of the Profilometer was in checking the races of tapered roller bearings then in use. Readings of 15 micro-inches were recorded on these surfaces which to the eye appeared very smooth, but in the reading of 15 micro-inches was the answer to the brinelling of bearing races. The rolls were not supported on base metal but on a surface composed of microscopic peaks with valleys measuring 15 micro-inches in depth. Under constant vibration the rolls wore through this thin layer and stopped when solid base metal was reached. It was obvious that a process that would remove this layer was required. It had to be practical from a production viewpoint and at a very little extra cost. The guiding hand of the Profilometer revealed every improvement as developed by our research work and with valued assistance from Microphotography and the Comparator Microscope a process was developed which is termed Superfinish. Briefly it is a process whereby all surface roughness and imperfections are removed and a new surface produced at base metal in a few seconds time and a smoothness of a few micro-inches.

"Superfinish"

The name Superfinish was selected to designate the new method of producing surface finish and to distinguish it from other methods in common use, such as turning, grinding, honing and lapping.

1. In turning or boring, helical grooves are formed on the surface, the pitch of the grooves depending on the rate of feed used per revolution of tool or work. Many factors influence the finish such as amount of stock removed, shape of tool point, speed and feeds, etc.

2. Grinding employs bonded abrasives operating at very high speed 4,000 to 8,000 feet per minute and heavy pressure between wheel and work which produces considerable surface distortion and roughness ranging from ten to seventy-five micro-inches.

3. Honing is a modification of grinding practice and its use is limited principally to inside diameters or hole work. The speed used is less than that of grinding but the pressure remains high. Surface finish ranging from five to fifty micro-inches can be produced with honing.

4. Lapping is used for all shapes of surfaces and is accomplished by either using a powdered abrasive mixed with a lubricant, usually oil, or by charging lead copper or cast iron with lapping compound and operating it on the surface to be lapped. Both methods of operation are slow and require the service of a skilled operator. The resulting surface, when examined by the microscope Microphotography and Profilometer, reveal a multiplicity of fine scratches.

5. Superfinish is a finish that is produced by blending a combination of several distinct motions with the use of hard finishing stones, proper compound, or solution. Speeds are low and low pressure is applied to the surface. The frequency with which the direction of stone travel is changed is high, yet the actual travel in feet per minute is very low in comparison with grinding or honing.

The gratifying results obtained with superfinish on tapered roller bearing races led to efforts being made for its application to other motor parts and the crankshaft was selected.

A tapered roller bearing and a crank-

shaft bearing operate on entirely different mechanical principles. A roller bearing has rolling friction only from the rolls rolling on the races.

The crankshaft bearing depends on the bearing load being supported on the oil film over the projected area of the bearing and in theory the internal friction of the oil film itself is the only friction present in a perfect bearing operating under ideal conditions.

Higher compression ratios and increased engine speeds have imposed additional loads on the bearings in use today and this means that bearings must be finished with greater accuracy and surface finish must be of a new order with a smoothness of a few micro-inches.

A crankshaft bearing surface that has irregularities, grooves and ridges may not have sufficient bearing area to maintain the protecting film of oil under the increased pressure caused by the reduced area.

Metallic contact occurs, heat is generated from friction and bearing failure may result.

It is estimated that with a super-finished bearing surface the area covered by scratches would be but a fraction of one per cent of the surface.

In grinding crankshaft pin bearings, no traverse is used between wheel and work; consequently, the surface is torn and distorted, grooves and ridges formed on the bearing surface. These are plainly visible with a microscope and often can be seen with the naked eye.

Certain factors, such as grade of grinding wheel, method of dressing wheel and amount of stock removed have an influence on this condition.

In lapping a crankshaft pin bearing by means of paper or cloth charged with abrasive, there is a natural tendency for the paper or cloth to follow and conform to the surface irregularity, presented to it. While this method may produce a bright glossy bearing surface which is caused from light reflected from scratches and to which the layman might seem to be perfection, such is not the case. The impartial evidence of the Profilometer and micro-photos clearly discloses the true condition.

Developing a New Process

The Chrysler management, realizing the evident limitations of the surface finishing methods in use, instituted a program of experimental development for surface finishing. Fixed abrasives were to be used as they held the only promise of removing the surface irregularities and bringing the surface to base metal.

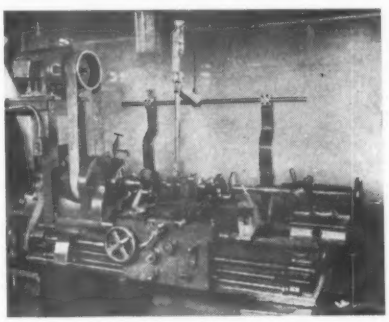

Figure 2

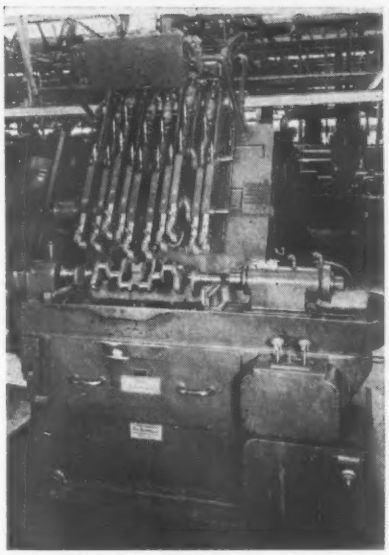

Figure 3

A lathe was chosen for crankshaft development as it is easily adapted for this work. A period of time elapsed before anything feasible was devised and many ideas and tools discarded. Finally the basic method was produced as shown in Figure No. 2.

Here we have the crankshaft mounted between centers and driven from the flange end. At the back of the machine a round bar was supported by two brackets fastened to the lathe bed.

The finishing head was connected to the bar by means of a lever which pivoted on the bar and could be moved laterally in order to finish the different crankshaft bearings. In the finishing head, a stone holder was mounted in a slide and actuated by means of an electric motor attached at the upper end.

In operation the finishing head followed the revolving crank pin bearing be means of the pivoted lever, it was held in contact with the bearing by hand. The electric motor reciprocated the stone holder.

This method was successful from an experimental view as it produced a new type of surface finish that was impossible with any other method. But being partly mechanical, and partly hand operated, it was obvious that it was not feasible to construct a machine operating in the same manner.

The basic principle alone could be utilized and all thought of hand operation discarded. Instead of finding the solution to the problem, we were now confronted with the proposition of designing mechanical movements, pressure, control and means of synchronizing the motion of revolving crank pin bearings with the finishing heads.

In connection with this, provision had to be made for adequate supply of coolant to the bearings. The electric motors for reciprocating the stones in the finishing heads had to be started before the stones contacted the crank bearings while the shaft was rotating.

These, and many others, had to be solved to the satisfaction of the Management before a machine could be built. But by sparing neither expense nor effort a design was finally developed that embraced all the requirements and a machine was built. This development required a period of approximately two years and in the improvement of surface finishing of a crankshaft bearing the efforts were amply rewarded.

The machine is shown in Figure No. 3. The limitations of the experimental model no longer exists in the finished machine. Hydraulically operated movements timed and automatically controlled replace the hand control of the model. Dual master crankshafts provide for synchronization of finishing heads and crank pin bearings; these master cranks being mounted on a slide which automatically raises at the end of the cycle to permit unloading and loading.

Connecting rods mounted on the master cranks carry the finishing heads in perfect unison with the work at all times. Coolant is supplied between the stones to each bearing.

The operating cycle is as follows: A crank is placed in the machine and automatically engaged in relationship with master cranks by means of locating pins in the head stock which register with the holes in the flange end of the crank. By shifting a control lever the tail stock center is brought into position. The crank is now located and as the slide control is shifted it advances to the work carrying the finishing heads which contact the bearings as the work and masters rotate at the same speed. The electric motors are started and a flow of coolant supplied to each bearing.

At the end of the variable time cycle the slide raises while all rotation ceases and the work is ready to remove. The actual finishing time is 20 to 30 seconds and can be set from a few seconds to several minutes. Crank bearings with a Profilometer reading of 35-40 micro-inches are rapidly reduced to readings of 5-9 micro-inches using stones of Grade 500-H.

When worn out a new set of stones mounted in a holder may be inserted

(Continued on page 21)

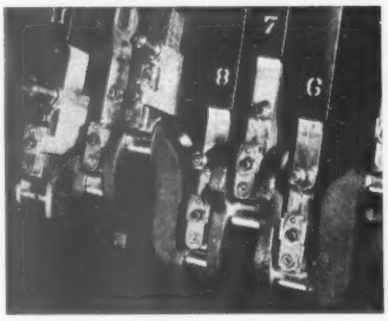

Figure 4

Safety in TOOL ENGINEERING

By C. THIEDE
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CHRYSLER JEFFERSON PLANT
VICE-CHAIRMAN, DETROIT CHAPTER
AMERICAN SOCIETY OF TOOL ENGINEERS

IN THE PAST when purchasing new machinery and equipment very little attention was paid to the safety of the operator of the machine, but due to the efforts of the National Safety Council we have been made safety conscious and today a great deal of thought is given to the operator's safety before approving a proposal for purchase. The machine, by itself cannot cause an injury, but, when the human factor enters in combination with the machine, injury can result from this combination. This human factor may be the machine operator, or the designer of the machine, or it may be the manufacturer of the machine, because in every piece of power driven equipment there is a man-made hazard and some of these hazards can be reduced if not entirely eliminated.

If when requesting proposals for new machinery, the purchaser would submit to the manufacturer a list of specifications covering all important points and should include the following items for safety reasons, as, all moving parts to be properly guarded or enclosed; automatic lubrication, to prevent anyone from oiling the machine while it is running. Operating pressures of hydraulic machines should not exceed 800 pounds per square inch, for the oil becomes very hot and excessive vibration is set up in the entire system. It is quite obvious that the continuous vibration and excessive strain that the entire system is subjected to will cause the tubing to become fatigued and crystallization will set in, and the tubing will break and may spray hot oil on the operator. If you require the vendor to specify in his proposal the operating pressure, the diameter of the cylinders and the diameter of the piston rod, you can determine for yourself if the machine the manufacturer is quoting will deliver the desired tonage at safe operating pressures.

Electrical Specifications Important

All electrical control circuits to be 110 volts. Unless you specify 110 volts for your control circuits, especially on large automatic and semi-automatic machinery, the manufacturer may wire the entire machine for 440 volts. Theoretically 440 volts is not a hazard, but the condition around machines will often make it a hazard. For instance, I know of a case where a machine was wired throughout for 440 volts. In the control circuit of this machine there were several solenoids. One of the solenoids operated a hydraulic valve that in turn operated a locating pin. This particular solenoid was energized at all times. Some of the cutting compound used on this machine worked its way into the hydraulic oil and out through the hydraulic valves and into the solenoid, causing a short circuit while the machine was in operation. The index pin moved out of position and the drum on this machine started to index while the eighteen tools were cutting. The tools broke and pieces of them flew around the operator's head and face. Fortunately he was not injured. The control circuit on this machine has been re-wired for 110 volts. It is over a year since this machine was changed and we have experienced no more trouble from this source, and probably, at this time, more water than ever finds its way into the hydraulic oil because the machines have become worn.

When separate motors are used to drive cutting tools and feed mechanisms a suitable inter-lock should be installed to stop all motors when any one motor stops. It is necessary to include this item because if you don't, you will receive machines that do not have this safety feature and some day the motor that supplies power for your cutting tools will fail and your feed will continue until drills, taps, cutter teeth, etc., are raining around the operator like shrapnel.

Punch presses should have safety equipment attached for operating the clutch and the type to be used should be specified by the purchaser. In case this safety equipment consists of push buttons and a solenoid, the push buttons should be of the type that cannot be wedged back by the operator. In case this safety equipment consists of levers that have to be depressed to operate the clutch, they should be designed so that the operator cannot hang weights on either of the levers and then operate the press with one hand.

Some installations of the photo-electric cell have been made to safeguard the operator. I have only seen one of these installations and this particular one created a hazard that would not have been present if sufficient thought had been given to the installation. The electric eye was mounted at one end of the press and it was necessary for the operator to take one step backward to remove his body from the path of the beam. Sometimes he would take two steps backward and on the second step backward his foot was carried into the aisle. In relating this incident, I did not do so to ridicule the photo-electric cell because this instrument can be and probably is being used in a great many places for safety purposes. I do wish to point out that it is necessary for the operator to remove himself out of the beam and he may move from one dangerous position to another dangerous position.

Safety in Welding

Welding machinery and especially in the case of hydromatic welders, special attention should be paid that all parts that are to be welded together are located mechanically so that it is not necessary for the operator to hold any part that will bring his fingers near the welding guns. Where it is necessary for more than one operator to work on a welder, suitable controls should be installed so that the machine will not start its cycle until each operator has set his control. Here again, I wish to stress the importance of having the control circuits wired for 110 volts, because there is always water present around a welding machine, due to the welding points, bearings and other parts being water cooled and with the best of maintenance there are always some leaking joints. After a welding machine has been down for repairs of any kind, a hard and fast rule should be set, that the Electrical Department check the electrical hook-up before the machine is turned over to the operator.

A point that is often overlooked by machine designers and should be examined closely by the purchaser is the accessibility of the cutting tools. The machine should be designed so that all tools can readily be changed when they become dull. If it is difficult to change tools you are building a hazard into a machine, because the operator will, sooner or later, injure his hands in changing tools and he is also likely to leave the tools in too long and then most anything can happen.

There are always some parts on a machine that are subject to wear or adjustment. The machine should be so designed that the parts that have to be replaced or adjusted are readily accessible to the repairmen. Here again, if it is difficult to repair or adjust a machine, necessary repairs are delayed, adjustments are made haphazardly and accidents will result, therefrom. We

have all seen an operator prepare to place his work in a chuck and then the chuck start to revolve. The reason for this was that the adjusting screws or collars on the clutch were hard to get at and a poor or hurried adjustment was made.

There are some machines in use today where the clutch operating lever moves in a vertical plane, that is, to start the machine you push the lever down, and to stop the machine you push the lever up. The lever is attached to a shaft that runs the full length of the machine and it is held up by whatever friction the shaft has in its bearings. When the shaft or bearings become worn, the weight of the lever plus a little vibration in the machine will cause the lever to move down and engage the clutch sufficiently to start the spindle to revolve. Obviously this is a dangerous machine and the danger can be removed by inserting a spring ball or a latch in the lever, but the point I wish to emphasize here, is, that if you do not cover these points in your specifications you may purchase a machine that is a constant hazard to the operator.

All outside corners of machines and fixtures should have a liberal radius to remove sharp corners that have been responsible for accidents in the past. The machine designers lately have gone further than this on some machines. They have closed up the entire column to give the machine a streamlined appearance. In order to repair or adjust the mechanism inside the column, openings have been cut in the column and these openings have neat fitting covers that are held in place by a row of bolts around the cover to make an oil tight joint. These covers should be fitted with a hinge so that when it is necessary to work on the machine, the cover can be swung to one side. This will prevent the repair man from removing all the bolts but one at the top. Swing the cover up and try to hold it at that position with one bolt. There should be sufficient clearance between the hinge and hinge pin to permit pulling the cover up oil tight with the bolts provided for that purpose.

Designing for Safety in Fixtures

Particular care should be paid in designing fixtures where it is necessary for the operator to load the fixtures by hand to see that sufficient room is allowed to load the fixture and unload the fixture with continuously hitting the sides of the fixtures with the hands. In order to design a fixture that is easy to load the first thing to do is to ascertain where the operator can, or will, hold the part to load it. Sometimes this can be found by observation in the shop on similar parts or by talking to the foreman. Quite often you will see fixtures in use where it has been necessary to cut out a portion of the side wall to permit the operator to remove the part from the fixture and again you will see that it is necessary for the operator to use a hook to remove the part because if a clearance was cut in the fixture for his hands, it would weaken the fixture too much. In both cases the operator probably was injured before he was given a hook to remove the work or an opening was cut for his hands, and fixtures of this type will continue to find their way into shops until Tool Design Departments get out of the following bad habit. After the Tool Designer reads the order and recalls that he designed a fixture that was similar to the one covered by the order in his hand, he goes to the file, gets out the tracing of the fixture he had in mind, clips the order to it and hands the order and tracing to the first designer out of a job and instructs him to follow the design he has given him with the order. The designer, being a human being, does just as he has been instructed to do. In a short time another fixture is put into production, the operator skins his hands placing the work into it and then we cut clearances for his hands, if we can.

Checking Fixtures

To illustrate the importance of checking all fixtures with the shop before duplicating or using the drawing of any fixture as a reference to design a similar fixture, I wish to relate an experience I had almost ten years ago. We received an order to design a fixture to drill certain holes in a clutch housing pan. I recalled that just recently we designed a similar fixture for a clutch housing pan on another model. Immediately the thought passed through my mind to get out the drawings and design this new fixture the same as the previous fixture. That same day I found it necessary to go into the shop. On my way back I passed the clutch housing department and stopped to look at the fixture previously mentioned. The operator would place a part in the fixture, hold it with his left hand, turn the air valve with his right hand, bring down the head, do the operation, remove the part and it appeared to be a very efficient fixture. The foreman of the department was at his desk and I walked over and asked him how he liked that fixture. I'll confess that I did not ask the foreman this question to find out if the fixture was safe, the fact is, I expected to be complimented and that is just what the foreman started out to do. He stated that it was a very good fixture, the parts were machined to the gage and that no scrap had been produced on this fixture. Then he took the wind out of my sails and unconsciously he taught me never to duplicate a fixture until it had been investigated from every angle by remarking, "I have to be careful which operator I put on that job because his hand is pretty close to that air clamp when he loads the part." I can assure you that we moved the clamps on the new fixture away from the point where the operator placed his hand and altered the fixture that was already in production. Obviously all equipment should be investigated before it is duplicated, but in my opinion, this method of re-ordering occurs oftener in the case of fixtures than any other type of equipment.

Hand Clamping

Where hand clamping is employed, especially set screws for holding tool bits, every effort should be made to have all the heads the same size so that one wrench can be used to tighten all screws. When the operator has more than one size wrench to use he will get hold of the wrong one to tighten a screw. The wrench will slip off and he will probably injure his hands. Operators become so accustomed to a certain size or type of wrench that if they use a different type than the one to which they are accustomed, even if it is only longer or shorter, accidents have resulted therefrom and have been reported as such on the accident reports. Therefore, it is important that all wrenches appear on the operation sheets to prevent the Tool Supervisor from replacing worn out wrenches with wrenches to which the operators are not accustomed.

When "C" Washers are used in the clamping arrangement and the "C" Washer is very large it should not be a loose part. It is safer to fasten an arm to the "C" Washer and pivot the arm at the opposite end at the proper height so the "C" Washer can be swung into position. After the operator has handled a loose heavy "C" Washer for 6 or 7 hours his hands become fatigued and he may drop it on his feet.

The old familiar five pointed hand knob has stayed with us a long time and I can't think of any other one thing that has caused so many sore hands. It is very seldom that you see a hand knob on a fixture that has not been wrapped with rags or tape or that the operator has a flat bar with three pins set in it to fit between the points so that he can tighten the part securely in the fixture. If you cannot use air or hydraulic clamping then use a fixture lock but be sure that the designer understands how to adapt it to the fixture. These locks are very efficient and safe if the proper size and type are selected for the work they are assigned to do.

Chucking Made Safe

On machines where it is necessary to chuck the work it is advisable from the standpoint of safety to specify air, hydraulic or electric chucking equipment. The hand operated chuck has been a good and faithful servant, but when you consider that the operator must keep his mind on holding the work to be chucked and also on the wrench which is awkward to handle with one hand, the automatic type of chuck is safer.

There are still some pressure paint tanks on the market that have cast heads. Be sure to specify that the head of the tank is to be a steel stamping because too many lives have already been lost due to this cast head. Suitable testing equipment should be installed to

(Continued on page 21)

GENERAL PURPOSE CENTER-TYPE GRINDERS

In the Production Line

By FRANK GERTISER
MANAGER, DETROIT OFFICE
THE CINCINNATI MILLING MACHINE CO.
CINCINNATI GRINDERS INCORPORATED

THE MENTION of a center-type grinder usually brings to mind a general purpose grinding machine, capable of producing accurate cylindrical work and smooth finishes, but rather limited in its rate of production. However, several recent advances in the design of this type of machine have pushed up production possibilities very noticeably, without detracting in the least from its general purpose characteristics. The majority of these advances have been for the purpose of eliminating hand motions and fatigue incident to operating the machine. Any change which makes the operator's job easier will surely reflect in increased production.

A notable example in this trend toward less effort for higher production on center-type grinders is the CINCINNATI Plain Hydraulic Grinding Machine. When plunge cut grinding, one movement of the right hand of the operator accomplishes three things, thereby eliminating 2/3 of the normal fatigue. When the hydraulic infeed lever, part of the standard machine, is moved through a ¼ circle arc to a positive stop, three things happen:

1. The work moves towards the wheel, at a rapid rate while cutting air, and then at a grinding rate just before work contact and continuing to the positive stop.
2. The coolant flow automatically starts at the first 5° of motion.
3. The work rotation automatically starts at the first 5° of motion.

Another example of this reduction in the fatigue of manipulation is the Cincinnati Universal Grinding Machine. The table traverse control lever on this machine also controls the instantaneous starting and stopping of the coolant flow and work rotation. In addition to reducing fatigue, non-productive time consuming motions are reduced by 2/3.

Figure 1

Special and standard attachments increase production of center-type grinders still further, often at no expense to the general purpose characteristics of the machine. In such cases, we have the possibility of general purpose grinding machines being located in a high production line. One of the big advantages of such an arrangement is that design changes in the part being ground do not obsolete the machine. It can still be used for other grinding operations, sometimes without even removing the attachement required for the superseded part.

The Semi-Automatic Infeed Attachment for the Cincinnati Plain Hydraulic Grinding Machine, Figure 1, falls into this classification of center-type grinder attachments which increase production possibilities without confining the machine to one type of work or to one specific grinding operation. The attachment hydraulically controls the infeed and retraction of the work towards the wheel through the motion of a hand-control lever.

In the down position of the infeed lever, as shown in the illustration, the saddle and table have moved forward to the end of the grinding stroke. When the lever is moved to its up position, oil in the right hand dash-pot is displaced around a by-pass, while a heavy spring in the left hand dash-pot is compressed. The design of the piston in the cylinder at the right permits a rapid flow of oil displacement, allowing the handle to be easily and quickly brought up to its loading position. The attachment remains in this position while the operator is unloading and loading the work, and remains fixed until started on its grinding cycle by hand. A slight downward motion by hand is all that is required to start the automatic infeed to work size. The infeed motion is rapid for the first 25° of downward motion of the handle (11/32" movement of the work towards the wheel) and at the proper grinding rate for the remaining 33° of motion (.030" movement of the work towards the wheel). The design of the hydraulic cylinder at the right permits a rapid escapement of oil during the rapid advance, and a slower escapement during the grinding stroke. This part of the stroke is adjustable for rate of travel. A fixed stop limits the downward stroke of the lever, and provides an accurate method of sizing the work.

When the handle is moved to the up position, the saddle and table move away from the wheel a sufficient amount for loading and unloading the

(Continued on page 36)

Figure 2

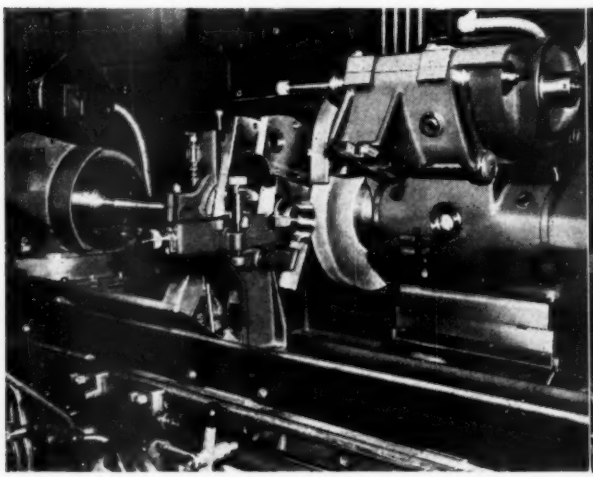
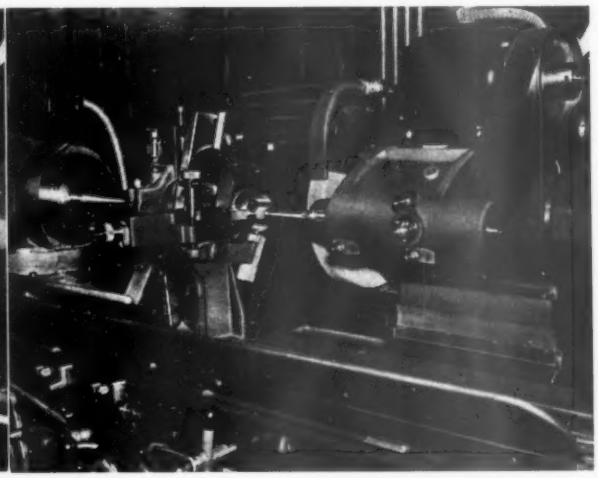


Figure 3



Dedication of the
BENJAMIN FRANKLIN MEMORIAL

A.S.T.E.—ONE OF FOUR ENGINEERING SOCIETIES TO PARTICIPATE

By H. CADWALLADER, JR.
DELEGATE FOR THE A.S.T.E.

To National Officers of A.S.T.E. and Members:

IN PRESENTING this report of the progress of this international event—let me say to each member of the A.S.T.E., had you experienced the honors bestowed on A.S.T.E. in course of this affair, you certainly would feel proud that your name is registered in its archives.

Two hundred and seventy well-known organizations of Europe and America were represented at the formal Dedication of the Benjamin Franklin Memorial at the Franklin Institute, Philadelphia, Pa., on May 19, 20, and 21. Among a limited number of American technical societies so represented was the American Society of Tool Engineers.

The new memorial, which is now open to the public daily as a national Franklin shrine, is fittingly located in a magnificent structure devoted to the advancement of science and the mechanic arts. In the building, which fronts on Philadelphia's famed Benjamin Franklin Parkway, The Franklin Institute maintains its Fels Planetarium, where the sky is startlingly reproduced, and its unique Wonderland of Science Museum, where more than 4,000 action exhibits reveal the part played by science in everyday life.

In this notable panorama of wonders, and the stately marble memorial room known as Franklin Hall, there stands the new statue of Franklin, which is now the spiritual center. Presenting a seated figure of Franklin, approximately twice life size, in Serevezza marble of the purest whiteness, on a massive pedestal of Rose Aurora marble from Portugal, the statue, executed by the noted sculptor, James Earle Fraser, is comparable in grandeur to that of the Lincoln Memorial in Washington. The statue, on its pedestal, rises eighteen feet above the floor, and the combined weight of statue and pedestal is 120 tons. The late Mr. William L. McLean, former publisher of the "Philadelphia Evening Bulletin," gave $100,000 for its construction. This great statue was completely veiled in white as official delegates to the Dedication assembled in Franklin Hall Thursday morning, May 19.

Before describing the dedicatory events, it may be in order to sketch briefly the history of the new memorial. In 1927, the Poor Richard Club of Philadelphia launched a movement which led to the formation of the Benjamin Franklin Memorial, Inc., for the purpose of providing a fitting memorial to Franklin. Its first President was the late Cyrus H. K. Curtis. At the same time, the Franklin Institute was planning to make available to the public its distinctive museum. Realizing that the aims of the Institute were in keeping with the ideals of Benjamin Franklin, The Benjamin Franklin Memorial, Inc., joined forces with that institution, and funds were raised in a whirlwind campaign in 1930. The building was erected, and the Institute opened its Fels Planetarium in November, 1933, and its scientific museum on January 1, 1934. The dedication of the new memorial brings the entire project to completion.

MR. CADWALLADER

The Franklin Institute was organized in 1824, and has a long and honorable record in the world of science. Through its Committee on Science and Arts, it bestows its coveted Franklin medal and other medals annually upon outstanding scientific benefactors of mankind.

In the main dedication ceremony, held on and in front of the east portico of the building in the presence of the official delegates, members of the Institute, invited guests and thousands representing the general public, former Senator Pepper spoke of Franklin as a citizen and patriot; and the French Ambassador paid to him the tribute of the world at large. Immediately thereafter, the dedicating party retired to Franklin Hall, where Secretary Roper read a message from the President of the United States; after which ten-year-old Miss Louisa Johnston Castle, lineal descendant of Benjamin Franklin, unveiled the great statue by training a flashlight upon an "electric eye" or photo-electric cell.

The events of the first day closed with a dinner given in Franklin Hall by the Poor Richard Club, at which Secretary Roper gave a talk, the gist of which was that America is fundamentally sound, but that both capital and labor have responsibilities as well as rights and must exercise them publicly if the capitalistic system is to survive.

Pure Science was the general theme of a notable series of lectures given at

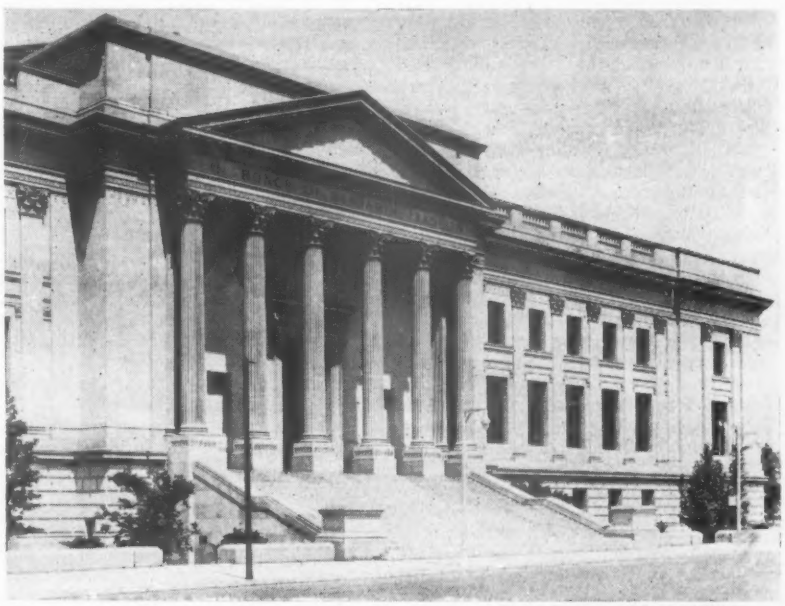


Photo Courtesy of Gladys Müller

The Franklin Institute on May 20. Sir James C. Irvine told of the events that led the University of Saint Andrews in 1759 to confer upon Franklin the first of his numerous honorary degrees in 1759.

Dr. C. E. K. Mees, director of the research laboratories of the Eastman Kodak Company, outlined the newest ideas of his colleagues and workers in his field and showed color photographs of various dye crystals which make modern color photography possible. Dr. Gilbert N. Lewis, dean of the College of Chemistry of the University of California, discussed old and new views of acids.

Dr. George D. Birkhoff, professor of mathematics at Harvard University, described a new theory of electricity, which, he said, resembled Franklin's ideas more closely than other modern theories. His theory, if accepted, would change many modern conceptions of space-time and the atom, he stated. The influence upon science of astronomy was discussed by Dr. Forest Ray Moulton, Permanent Secretary of the American Association for the Advancement of Science, Washington, D. C.

Dr. Arthur L. Day, former Director of the Geophysical Laboratory of the Carnegie Institute, Washington, D. C., gave an interesting study phenomena of volcanoes, geysers, and hot springs. Dr. Louis Martin, Pasteur Institute Director, talked on the hospitalization of contagious diseases, and described a new three-in-one vaccine against diptheria, typhoid and tetanus which has been used in the French army for the past two years.

Dr. Thomas H. Morgan, zoologist of the California Institute of Technology outlined modern theories in the field of genetics. Dr. Merritt L. Fernald, botanist of Harvard University, made a plea for the preservation of native wild flora, which, he said, is in danger of being destroyed by a misconception of the true meaning of conservation.

That evening, in a solemn ceremony in Franklin Hall, The Franklin Institute made its annual award of medals and the University of Pennsylvania conferred honorary degrees upon five of the visiting men of science.

The Institute's Franklin medal, which has in the past been bestowed upon such benefactors of humanity as Edison, Einstein, Kettering, Milikan, Jewett, Elihu Thompson, Sir William Bragg, and others was this year awarded to Dr. William Frederick Durand, professor emeritus of mechanical engineering at Stanford University, for pioneer research in the theory of aeronautics and his contributions to the theory of aircraft propellers; and to Dr. Charles August Kraus, professor of chemistry at Brown University, for contributions in fundamental chemical research, especially reactions in liquid ammonia.

On the final day, May 21, a series of lectures on applied science were given. Discussing Franklin's favorite field of science, electricity, Dr. Willis R. Whitney, vice president in charge of Research of General Electric Company, pointed out that most of the advances in electricity had come about because "someone digressed with his pure imagination far enough to establish new and useful things," and urged those interested in the science not to be worried by "quite harmless scientific bugaboos," but to give free rein to their inquisitiveness, as Franklin did.

Dr. Abel Wolman, professor of sanitary engineering at Johns Hopkins University, talking on civil engineering, said that local governments must adapt themselves to the new problems of preserving natural resources in the public interest, and that civil engineers are continuing Franklin's task of "subduing the ugly facts of society to some more rational scheme of things."

Speaking on "Engineering and Health," Dr. Harvey N. Davis, President of Stevens Institute of Technology, said that "by far the most effective way of raising the general health level of any population is to raise its standard of living. This problem is fundamentally not medical but economic."

Vying with these distinguished speakers for the interest of the delegates and visitors throughout the three days were the numerous scientific and technical displays in the Wonderland of Science Museum.

Developments in electricity were shown, from an electrical machine which Franklin once owned and experimented with, to modern half-million volt urge generator producing man-made lightning.

In the "New 1938 House of Magic," invisible light was made visible and other startling and entertaining demonstrations performed. Progress in printing, Franklin's own craft, was demonstrated from a hand-press used in Franklin's original printing shop to modern presses that print in four colors.

Paper-making was performed by hand just as it was in Franklin's day, and the entire modern process from pulp to finished paper also was demonstrated on a miniature scale model Fourdrinier paper-making machine. A replica of the "Pennsylvania Fireplace," one of Franklin's outstanding inventions, was shown, and in contrast there was an exhibition of the development within the last twenty years in automatic oil heating equipment for home use.

Special exhibits of equal interest were on display in sections devoted to Aviation, Astronomy, Railway, Land and Marine Transportation, Chemistry, Physics, Music, Medicine, Fire Fighting, etc. Most of the special dedication exhibits remain in the museum throughout the summer.

It was gratifying to bear the standard of the American Society of Tool Engineers among the representatives of these distinguished groups, and to know that ours was one of but four engineering societies represented at the Dedication. At a luncheon held at the Rittenhouse Club on May 21, at the conclusion of the lectures on applied science, our Society was one of but eight invited to be represented.

Only with ill grace could the writer close this necessarily high-lighted reviews of these important events without expressing appreciation and courtesies extended to him as your representative by Mr. W. Chattin Wetherill, Vice President of the Franklin Institute and Chairman of the Dedication Program Committee; Mr. Richard W. Lloyd, Assistant Treasurer of the Institute; and Mr. Henry S. Harris, of the Institute's Department of Public Relations.

Your Philadelphia Chapter of A.S.T.E. is to be complimented in no small way for its team work and hearty co-operation. A.S.T.E. has been given a new place in the sun.

All of which is respectfully submitted.

"Bill" Hart Lists Machine Tool Trends

"Streamlining" for appearance, incorporation of more and better safety features to protect workmen, and the provision of more mechanical and hydraulic operating features to reduce fatigue are among the most important design trends in machine tools, according to A.S.T.E.'er W. A. (Bill) Hart, Chief Engineer, Colonial Broach Company.

Speaking before the Works Foremen's Club in Fort Wayne, June 9th, on the subject of "Broaches and Broaching Machines," Mr. Hart said that, today, the mechanical performance of machine tools is taken almost as much for granted by customers as the mechanical reliability of an automobile.

"While 'Streamlining' is coming in strong in the machine tool field for appearance reasons primarily," Mr. Hart continued, "the cleaning up of exteriors and provision of smoother shapes also provide definite operating advantages. Such machines are easier to keep clean and stimulate the operator psychologically to keep his tools in better condition.

"Floor space continues to be regarded as an important factor in the selection of machine tools," Mr. Hart said. An important contributing factor in this respect, he believed, was that machine tools occupying less floor space reduce handling of parts between operations. This, he said, was one reason for the relative popularity of such compact broaching machines as the vertical machines for surface broaching operations.

As in other types of machinery, broaching machines, he added, were being provided with better safety controls—frequently of the dual type—so that operators would have to have both hands away from the work before the machine can be started.

This development is extremely important on the newer types of broaching machines with their interlocking rams, fixtures and receding tables. Such developments, he pointed out, are contributing extensively to making the job easier for the machine operator, reducing fatigue, as well as providing higher outputs per machine day.

Production Perspectives

NEWS OF MASS MANUFACTURING FROM EVERYWHERE

MID-WEST

Probably of greatest significance in the industrial world is the "Pump Priming" that industry is doing on its "own." During the past fortnight news has been flashed throughout the nation of the **$35,000,000 expansion program of Ford Motor Co. Also comes news from Pittsburgh's Westinghouse Electric and Manufacturing Company which will spend $12,000,000 on new buildings, new machinery and equipment** as well as other improvements and repairs in the company's district offices, radio stations, and plants, of which there are twenty-two. **A. W. Robertson,** Chairman of the Board of Westinghouse, **indicates that this sum,** approximately the same as was appropriated for similar projects in 1937, **is being spent because of faith that a revival of business is coming, "plus our natural desire to do our part in effecting a return of prosperity and employment."** The effect of these expenditures will be felt in scores of communities as the program extends all the way from Boston to Emeryville, California. **$2,000,000 will be spent in the New England** area; **$1,500,000 in New Jersey; $6,500,00 in Pennsylvania; $600,000 in Ohio; $200,000 in Maryland; $50,000 in Indiana. Of this sum approximately $5,000,000 of the total will be spent for equipment, including new machinery.** Major items include replacement of equipment and the **purchase of machine tools at East Pittsburgh.**

The Philco Radio and Television Corporation, Philadelphia, is entering the air conditioning field and **will market soon a portable air conditioning unit called Cool-Wave, which can be placed in any room of a home, office or hotel.**

April sales of vacuum cleaners were 112,100 units, **the largest total of any April in the industry's history,** excluding record 1937 totals, according to **C. G. Frantz, Secretary** of the Vacuum Cleaner Manufacturers' Association.

Despite the depression, 25 new industries have located in Cleveland since the beginning of the year, and 34 industries have expanded their plants. The new industries have brought to Cleveland a $300,000 annual payroll, while plant expansions have added 215,000 square feet of space to manufacturing facilities. Among the products manufactured by the new concerns are laundry equipment, incinerators, molded plastics, welding, plumbing and supplies, compressors and machinery.

The Independent Register Company of Cleveland has **let a contract** for a $40,000 **addition to its plant** at 3747 East 93rd Street.

Employment in the steel industry instead of declining in proportion to large scale adoption of continuous rolling mills and other technological advances in mill equipment, actually increased, the American Iron and Steel Institute have reported.

Lorenz Iverson, president of **Mesta Machine Company,** on June 15 **predicted a general pick-up in business this fall and added "There was considerable foreign business in view."** Iverson made his statement prior to sailing for Europe.

According to the monthly bulletin issued by **the National Industrial Conference Board, the Canadian business index in April rose from 93.6 to 99, a gain of 6%.** This was the second consecutive month rise and 35% of the November-February loss now has been recovered.

A $5,600,00 tire plant embodying scores of departures from conventional tire building methods has virtually been completed by the Ford Motor Company at its Rouge plant, Dearborn, Michigan. **Production rate at the present time is reported at about 4,000 tires per day, although much of the equipment remains to be installed.** It is said that capacity of this plant ultimately will be 6,000 tires and tubes per eight hour shift. The building itself has many unusual design features.

Remington Rand, Inc., recently announced that effective June 1 **reductions ranging from 5 to 25% would be made in wages of salaried employees. No change however was made in hourly rates.**

A total of 233,000 persons found jobs between March and April, cutting down the number of the nation's unemployed to 10,166,000, the National Industrial Conference Board estimated as of May 25. **The improvement lifted the total employed as of April 1 to 43,324,000** from 43,041,000 at the start of the preceding month and 42,840,000 at the beginning of February. On the latter date there were 10,550,000 persons unemployed according to the Board's statistics.

Philip O. Geier of the Cincinnati Milling Machine Company was **elected president of the Ohio Manufacturers' Association on** June 2, succeeding the late Charles F. Michael of Bucyrus.

Andrew J. Weatherwax, plant superintendent for the W. Bingham Company, was **stricken with a heart attack** and died **June 4.** He had been with the Cleveland Hardware concern since 1924. He is survived by his widow.

EAST

Self-help measures are being exerted in many New England cities and towns as a means of conserving industrial activity at a time when many old established concerns have curtailed their production. Much effort is being directed towards the leasing and occupancy of idle plants through community efforts seeking to establish new industries. Brockton, Mass., staged an "Industrial Week" and is stressing opportunities to open new industrial plants there. **New Bedford, Mass., raised a $50,000 fund for industrial promotion. Worcester has reported six new firms acquired through a special industrial committee** and a number of new products are being made there.

An **unusual record** has been **recorded for the Smith & Wesson, Inc.,** revolver concern in Springfield, Mass., **in more than doubling its employment force since the first of the year.** This is now at a peak level of 425.

More than $10,000,000 of new Industrial construction was completed in June in Mass., according to the Associated Industries of Massachusetts.

James Y. Scott, treasurer **of** the **Van Norman** Machine Tool Company of Springfield, **has announced the acquisition by purchase of the Producto Machine Company of Bridgeport,** Connecticut. The erection of a **new building on the present Van Norman site to handle production of the Producto Machine Company products will be started soon.** The Producto machines which now will be produced by the Van Norman Company, will include special milling machines adapted to aircraft, automobile and business machine manufacturing.

Byron F. Stowell, 65, **died at his home June 2.** For fifteen years **he had been consulting engineer for the Van Norman Machine Tool Company** of Springfield.

Patrick F. Murphy, 67, retired tool manufacturer of Chicopee Falls, **died suddenly recently.** For more than 25 years until 1929, he operated with his brother, John, now deceased, **the Hampden Tool Company.**

Operating at substantially the same level as during the earlier spring months, **Connecticut industry in June was marking time in anticipation of an upward swing in the late summer or early fall.** Plants devoted in whole or in part to the manufacture of building hardware and electrical equipment were expected to derive benefit from New York World's Fair orders in September. A rough estimate of the general production picture throughout the state of **Connecticut** points to **an average of 25% below the same period a year ago.**

The Bullard Company, Bridgeport, has **announced one-week vacations with pay for all employees of a year's standing or more, with a half-week for those employed between May and October, 1937.** Bridgeport Brass Company reports a net loss of $28,078 for the year ended April 20. **Niles-Bement-Pond Company** had a net profit of approximately $100,000 in April, but **backlog of orders is being reduced in line with curtailment in new business. Electrolux,** Inc., Greenwich, seeks bids on a **proposed addition to the second floor of its factory.**

Oildex Corp., has been formed in Terryville to manufacture all types of motors. Charles M. Gearing, works manager of the New Departure Division, General Motors Corporation, New Britain, has retired.

CHAPTER DOINGS

BRIDGEPORT

H. J. DeAngelis, Secretary

The June 9th meeting was well attended and enjoyed by those present. Cliff Cassidy, our program Chairman, introduced Mr. A. E. Weiss of the Superior Die Casting Co., and Mr. Roy Price of McCaskey Register Co.

Mr. Weiss gave an interesting talk on the development of die castings and illustrated with slides showing designs of complicated dies and die casting machines. He spoke of how in many instances parts can be changed slightly without impairing their purpose and thus greatly simplify the die design. So, designers, please have pity on the poor Tool Engineer and don't make it so tough for him when he has to design the dies. Not that we can't do it! Mr. Weiss closed his talk by answering questions and displaying many complicated castings.

Mr. Price followed with his lively and interesting talk on tool room control and mentioned many humorous incidents in connection with his experiences installing the McCaskey method of tool room control.

Herb Perkins, one of our good Tool Engineers has become a minion of the law in Bridgeport but is still with us and attends meetings. You can't tell what these Tool Engineers will do next. Perhaps he intends to use his Tool Engineering training to catch lawbreakers on a production basis. Lawbreakers beware.

There will not be any meetings of the Bridgeport Chapter for July and August. That will give Ben Page, Eddie Nevins, John Bullard and Cliff Cassidy more time to improve (?) their golf game.

BUFFALO

Ernest M. Dildine
Chapter Publicity Chairman

The June Meeting of the Buffalo Chapter was held on June 13th, at the Buffalo Trap and Field Club, with Mr. Howard Taylor presiding. The speaker for the evening was Mr. G. T. Vandermeulen, Clerk of the Surrogate's Court, who was introduced by Mr. Chas. Tauser, Chairman of Arrangements Committee. Mr. Vandermeulen's subject was "The Surrogate's Court." This proved to be exceptionally interesting as Mr. Vandermeulen outlined the history of the Court.

Central New York Chapter Proposed

A chapter of the American Society of Tool Engineers has been proposed for the Corning, Elmira, Waverly, Owego, Johnson City and Binghamton New York district and also to include the adjacent area of North Central Pennsylvania.

All interested Tool Engineers of this section are cordially invited to communicate with Mr. J. Don Reep, a director of the A.S.T.E. who has been placed in charge of the organization of a chapter in this section. Mr. Reep may be reached at 76 Pearl Street, Buffalo, New York.

The meeting was next open for business, which soon turned into a discussion of the Annual Picnic which is to be held some time in August. If you remember last year's picnic, you will not miss the picnic this year. The Committee has a number of surprises in store for you so watch for the date.

This was the last meeting until September, at which time the Committee has planned for a series of interesting meetings for the fall and winter.

CHICAGO

E. A. Smith
Chairman of Editorial Committee

On Saturday, June 18, approximately thirty members of the Chicago Chapter gathered at the Hillside Country Club for a day of golf. The day was warm and sunny and was enjoyed by all. Adolf Grib of Crane Company won first prize in the closely-fought blind bogey contest. The tournament was so successful, another one is being planned for August 6. The course and the exact date will be announced later.

The last meeting of the season of the Chicago Chapter was held on June 13, at the Machinery Club. A large number of members and friends turned out to hear a wonderful talk on "The Manufacture of Die Blocks" by Mr. Finkl of Finkl & Sons. Mr. Finkl showed a movie on the subject and conducted an open discussion that proved interesting.

Before the principal speaker of the evening was introduced, several A.S.T.E.'ers presented impromptu speeches. Chairman Ives has introduced a plan whereby members will obtain some experience in public speaking on subjects of interest to other members. This plan is working very satisfactorily and any member who desires this particular training may obtain the opportunity by speaking to the Chairman, Mr. Ives, or the secretary, Mr. Hein.

After the speeches a blackface skit was presented by Mr. Wingert, Chairman of the entertainment committee.

CINCINNATI

T. C. Vittetow, Secretary
% Alms Hotel, Cincinnati

A meeting was called June 9, to organize the new Cincinnati Chapter and started with a dinner at 6:30 in the Grill Room of Hotel Almo. There were eighteen men present for the dinner and about forty for the open meeting which started at 8:00.

Mr. T. C. Vittetow introduced Mr. Ford Lamb, of Detroit, who in turn introduced Mr. Walter Wagner, President of A.S.T.E., who addressed those present and then turned the meeting back to Mr. Lamb.

Mr. Lamb explained in detail the aims and purposes of the Society and after his talk answered various questions regarding the Society. Mr. Wagner then asked for a vote on the question of organizing. There were 25 "ayes" and no dissenting votes. Mr. Wagner then declared a Chapter and the work of organizing began.

After all applications were received the members voted on Chapter Officers. Those elected were: Mr. L. L. Weber, Chairman; Mr. Don Nersvick, Vice Chairman; Mr. George F. Diers, Treasurer; Mr. T. C. Vittetow, Secretary. The officers were then presented with their Charter of Cincinnati Chapter No. 21, and other impedimenta of office.

Mr. Weber then took charge and on suggestions from the floor it was decided to hold the next meeting July 14, at the Plant of Lodge & Shipley, in their new Temperature Control Room. This was accomplished through the efforts of Mr. Weber, who is connected with that company.

There being no further business, the meeting was brought to a close, after a standing vote of thanks was extended to Mr. Wagner and Mr. Lamb for their exceptionally efficient handling of this organization meeting.

DETROIT

J. F. Gilliam, Publicity Chairman
1604 Holden Ave., Detroit, Mich.

The meeting of June 9th at the Hotel Fort Shelby was attended by about one hundred members and guests.

A short business meeting followed the duck dinner which was served at 6:30 p. m. Chapter chairman, F. W. Eaton called on various committee chairman and officers for reports and comments. George Demorest, Treasurer, reported a favorable balance in the bank. R. M. Smith, Secretary, gave a short talk and stressed the ever present problem of delinquent dues. Augie Ketelsen, Chairman of the membership committee, gave a short report. J. P. DeMontigny, Chairman of Standards Committee, announced that work is being done by the national office toward zoning the territories to be worked by chapter standard committees; this has caused some confusion in the past. Ken Kuhn, Chairman of the Meetings Committee, announced the next meeting which will be held at Rammler Golf Club following the annual golf tournament on July 16.

Following the business meeting Ken Kuhn introduced Mr. K. W. Connor who presented a paper on "Processing and Honing Cylinder Bores." This lecture was illustrated by lantern slides and graphs to show comparison between six or eight different processes used by the leading automobile manufacturers.

Any A.S.T.E. members from any chapters happening to be in Detroit on Saturday, July 16th are heartily welcomed to join in our golf tournament at Rammler Golf Club. We can assure you plenty of fun.

MILWAUKEE

Emmor E. Houston, Chapter Publicity Chairman
1029 South 35th Street, Milwaukee

Milwaukee closed its season with a

smoker at the Milwaukee Eagles Club on June 17th. The affair was a success.

Chairman Rutzen and George Smart attended the all day rally of the Racine Chapter at Meadowbrook Country Club June 10th. It is reported that the rally was a success, and Rutzen and Smart both participated in the prizes.

Mark J. Hennessey, Chairman Industrial Relations Committee, asks that all those members who are in a position to employ local A.S.T.E. members, kindly get in touch with him at the Durant Manufacturing Co.

NEW YORK-NEW JERSEY

F. J. Oliver, Publicity Chairman
239 W. 39th Street, New York

Members of Chapter No. 14 were guests of the Wright Aeronautical Corp. at Paterson, N. J. at the closing meeting of the season, held on June 14. During the afternoon, guides took the A.S.T.E.'rs through the extensive shops and assembly department where they were able to examine in detail all phases of aircraft engine manufacture. A great many of the parts are made of nitrided alloy steel, machined and ground all over to tolerances unheard of in commercial shops. Members were almost lifted off their feet by the deafening roar of motors being "given the gun" on test stands as a regular part of final inspection.

In the evening, the company furnished the group with an excellent chicken dinner, after which various members of the Wright organization addressed the assembly. Raymond Young, assistant chief engineer, in speaking of aviation engineering problems indicated how experimental engines are worked up for production. Advances in design have reached the point where engines now run 400 hours between overhauls (corresponding to 75,000 to 100,000 flying miles).

K. E. Sutton, production manager, indicated how jobs were scheduled six months ahead and proper material flow provided. A nice balance has to be struck to keep employment steady and an even flow of parts to assembly. A Cyclone engine has about 700 different parts, and every order has some minor variations that complicate production control. Out of 3700 employees, 2000 are production workers, most of whom share in a group bonus. Some major parts are in process as long as three months, and bonus on these parts are paid on the basis of weekly inventories of parts in process.

Remo Rege, manager of the production engineering department and treasurer of this chapter, presented a detailed description of the major operations required to machine the nitralloy steel cylinder sleeves and the alloy aluminum heads. The sleeve or barrel is rough bored in two steps in multiple station vertical automatics, chucking first on the O.D. and then on the I.D. previously machined, to assure concentricity of the separate cuts. Some of the headaches of the service department were described by Wm. D. Kennedy, service manager of the Wright company. Following the technical talks, a film was presented on lubrication by the Socony-Vacuum Oil Co. Bill Brown, general superintendent of Wright, and one of the chapters active members, acted as host to the group and presided as chairman. The chapter expressed its appreciation through Chairman Frank Sheeley.

Bill Dinger, reporting for the Membership Committee, told of the chapter now numbering 143 members, with 18 applicants. He expects to bring the total up to 200 by the first meeting in September. Treasurer Rege reported a favorable balance in the treasury. Tom Orchard, chairman of the Entertainment Committee, told of plans for a golf tournament and stag outing scheduled for Saturday, Sept. 24, at the Pennbrook Golf Club at Basking Ridge, N. J.

PITTSBURGH

J. H. Thomas, Chapter Publicity Chairman
7442 Pennfield Court, Pittsburgh

Mr. F. W. Hallam, Mechanical Engineer of Tide Water Associated Oil Co. presented a paper on "Development of Cutting Oils" at the regular monthly meeting in McCanns Dining Room. About sixty members and guests attended

Mr. J. R. Weaver reported for the committee on the semi-annual membership meeting to be held in Pittsburgh Oct., 14-15.

T. R. Smith of Oakite Products Co. was present and provided plenty of music for the evening. His "Barbor of Moscow" was accepted but it was a close shave. For an encore he had F. W. Hallam accompany him with the aid of McCanns' kitchen equipment. It was real tin pan alley stuff.

We were glad to have Chairman Grace back after an illness, we hope he will continue to improve in health. With him at the meeting were; F. R. Dinger, J. E. Robinson, J. L. Finn, and John Norris all of The Robertshaw Thermostat Co.

F. Richards of Westinghouse Nuttal Works, an engineer interested in cuting oils was present with Carl Toperzer and Gardner Young also of Nuttal Works.

Mr. G. H. Alexander, Chief Mechanician of Mellon Institute was again present as a guest. We would like to have him as a member. George Longabough please take notice.

Mr. I. M. Dinger continues to serve in a pleasing manner as chairman of the entertainment committee. His work to date has been good. Long may he serve.

No meeting next month so have a happy vacation. Any suggestion for the October membership meeting should be sent to Mr. Weaver or Mr. Gangwere. Let's have your ideas.

ROCHESTER

C. G. Newton, Publicity Chairman
806 Gas & Electric Bldg., Rochester, N. Y.

The Rochester Chapter turned out one hundred strong Tuesday, June fourteenth, at eight p.m. to see and near about the products of one of their own leading industries. Bausch & Lomb Optical Company played host to the Society, supplying a comfortable meeting place as well as a capable speaker. Messrs. Henry Kurtz, Elmer Koch, M. H. Stevens, and Fred Loomis were on hand to greet the members of the Society. The high-light of the evening was a paper entitled "Optical Projection in the Shop," which was read by Mr. Fred Loomis. In Mr. Lommis' paper he disclosed the fact that optical instruments are relatively young as far as shop applications are concerned, being used in this manner only about twenty-five years. Today, however, common optical equipment including tool makers microscopes, optical protractors, inspection microscopes, tool setting instruments, measuring machines with microscopic reading devices as well as many others are commonly found in the modern manufacturing plant.

After the paper Mr. Henry Kurtz discussed several questions concerning optical problems as made from the floor. After this the Society adjourned to the Bausch & Lomb display room where they were given a free run to inspect the numerous optical products of their host. The high light of this inspection was Mr. William Powell's demonstration of the new Contour Projector which Mr. Loomis had so thoroughly described in his paper. Mr. Powell put on a very thorough demonstration and at the same time passed out helpful information to interested members concerning various projection problems.

ROCKFORD

Jess A. Early, Chairman Publicity
823 Brooke Road, Rockford, Ill.

We are greatly indebted to the many exhibitors for the roaring success of our last meeting and especially to Lincoln Electric Co. for their fine display, for furnishing the speaker of the evening and for the excellent movie slides which illustrated the lecture given by Mr. A. T. Cox, Jr., District Manager of Lincoln Electric Company.

Intense interest was shown in the many fine features of the Show from 4:00 p.m. until dinner was served at 6:30. No less than 100 members and their guests were served. Entertainment accompanied the feast and introductions of the exhibitors completed the dinner program.

The period from 7:30 to 8:15 was set aside for a recess and was spent in general relaxation. Some of the men engaged in story-telling, some inspecting the displays, some renewing old acquaintanceships and some just resting and visiting.

The Technical session started at 8:15 with Mr. A. T. Cox, Jr. giving the address of the evening on the subject, "Design for Welding." His talk was enhanced by movie slides and was of prime interest from start to finish. Mr. Cox invited his listeners to ask questions and the lecture was punctuated by many discussions which

brought out many valuable points. The pictures were clear the points covered were forceful and pungent, the interest was keen, and the whole session was educational. The Technical gathering came to a close at 9:30 when further visitation of the exhibits was in order. The meeting was officially ended when the last visitors left about 11:30.

Many mutually valuable connections were made between engineers and exhibitors, much good came from every department of the Show and,—all-in-all the gathering was a huge success and one to be long remembered.

SCHENECTADY

George F. Murphy, Secretary
Bldg. 37 General Electric Company
Schenectady, N. Y.

A local committee of Tool Engineers which had been endeavoring for several months to organize a chapter to affiliate with the American Society of Tool Engineers culminated its work on June 7th when approximately 100 Tool Engineers in this district met in the G. E. Educational Building on Erie Boulevard with several national officers.

Mr. C. H. Borneman, Supervisor of the Tool and Guage Department of the General Electric Company, opened the meeting and after a few introductory remarks presented Mr. Ford R. Lamb of Detroit, Executive Secretary of The Society.

Mr. Lamb outlined in detail the history and objectives of the organization, which was founded in 1932 in Detroit and has since been extended to the principal manufacturing centers throughout the country.

Mr. Lamb explained that the A.S.T.E. was primarily organized to generally promote Tool Engineering and afford its members an opportunity to exchange ideas.

In the course of his talk Mr. Lamb pointed out that The Society was incorporated as a non-profit organization for the purpose of advancing and furthering the arts and sciences of Tool Engineering among its members, to bring about a feeling of good fellowship and brotherhood, to hold readings and discussions on professional papers and to publish and disseminate such papers and reports to the members. Mr. Lamb touched upon the development of Tool Engineering up to the present time and emphasized the important position it holds in industry today. He stressed the responsibility for industrial growth in the creation of additional wealth and employment which rests in a great degree on the skill of the Tool Engineer, since no product is marketable unless it can be manufactured to sell at competitive prices and within the reach of the average worker. He stated that there is an unlimited field ahead of the Tool Engineer in maintaining the American standard of living which has always been much higher than that of any other country. As an example he cited the rapid growth of the plastic industry. In recent years hundreds of new articles have been produced as moulded parts instead of metal parts, and found a ready market because of improved quality and lower costs.

The chapter then elected the following officers. Chairman, Mr. Edward Ernest, Superintendent of the Tool & Die Department, G. E. Company; Vice Chairman, Mr. Fred Diehl; Secretary, Mr. G. F. Murphy; Treasurer, Mr. Ray E. Ellis.

On assuming the chair Mr. Ernest spoke briefly and congratulated the temporary committee who were responsible for the large attendance and called for a rising vote of thanks. The members of this committee were—C. H. Borneman, A. G. Cochrane, F.J. Diehl, Ray E. Ellis, J. M. Enders, E. W. Ernest, W. D. Gillespie, A. W. Gillespie, R. Hillner, C. Sertle, and J. A. Staehle, G. F. Murphy.

Mr. Borneman was selected as chairman of a committee to arrange a program of activities for the coming year. It is planned to bring many prominent men in the manufacturing field as speakers at chapter meetings and Mr. Lamb gave assurance of assistance from the national organization in procuring the services of these men. Meetings will be held on the second Thursday of each month.

Upon motion it was agreed to hold the charter open until June 20th for the benefit of interested Tool Engineer in Albany, Troy, Amsterdam and nearby cities. It is expected that a large number will take advantage of the opportunity and from present indications this will form the largest chapter that has as yet been chartered by the national organization.

Mr. Ernest then called upon Mr. B. G. Tang, General Superintendent of the General Electric Company, one of the charter members, who addressed the meeting and congratulated the national officers on their success in forming a local branch and particularly complimented them on the recent tool exhibition held under their auspices in Detroit which he said was the most interesting and best attended exhibition of its kind that he had ever attended. He also complimented the members on the interest shown as indicated by the large attendance and pointed out the advantages to be gained by affiliation with such an organization.

Before the meeting adjourned tentative plans were made to hold a dinner in conjunction with the first meeting which will be held in the near future.

ST. LOUIS

R. E. Laffler, Publicity Chairman
710 N. 12th Blvd., St. Louis, Mo.

The monthly meeting of the St. Louis Chapter was held at the Saum Hotel on May 19. The meeting was well attended by members and we had about thirty-five guests, all of whom listened with great interest to the very fine lecture given by Mr. Ed Uecher of the Linde Air Products Company with motion pictures showing jig welding. There was also a very interesting talk by Mr. E. Schurer of the Nesco Company on the tempering of steel.

We wish to thank those two gentlemen for their very instructive lectures.

We expect to have some interesting information to give out shortly relative to entertainment for our members.

Watch for publication!

SYRACUSE

W. E. Parish, Secretary
306 Crawford Avenue, Syracuse, N. Y.

Syracuse Chapter No. 19 was chartered on June 6 at Syracuse, New York, by Ford R. Lamb, Executive Secretary of The Society, with the assistance of J. Don Reep, National Director. Forty-five applications were received by the national officers with two others held for further information and three former members, making a total of fifty members in the charter group. There were also several additional applications which had not yet been completed but which will be considered in the charter membership of the Syracuse Chapter. The meeting was preceded by a dinner after which the temporary committee which had done the preliminary work of organizing the Syracuse Chapter explained what had been done to date and introduced the national officers who took over the meeting. After a full and complete description of The Society, its activities, finances, costs, etc., an election was held resulting in the following chapter officers: Chairman, A. H. Mitchell, Tool Planning Supervisor, New Process Gear Company; Vice-Chairman, Walter E. Roe, Auburn, New York, Master Mechanic with the American Locomotive Company; Secretary, Willard E. Parish, Tool Supervisor, Crouse Hinds Company; Treasurer, Francis C. Savage, Factory Superintendent, Air Cooled Motors Corporation.

After the election the charter was formally presented by Mr. Lamb, and the meeting turned over to the newly elected chapter officers. In addition to Mr. Lamb and Mr. Reep, Mr. George Keller of Buffalo, a member of the National Editorial Committee was also present and spoke briefly.

TOLEDO

Walter L. Ulrich, Publicity Chairman
% Spicer Manufacturing Company, Toledo, O.

Toledo Chapter No. 9, A.S.T.E. held their regular monthly dinner meeting at the Toledo Yacht Club the evening of May 24th. Approximately eighty members and guests were in attendance. Chairman August Ehrhardt presided at the short business discussion after the dinner, announcing the June meeting would be held at the same place on June 28th. He also read an invitation from the Mayor and City Council inviting the Chapter to participate in the Municipal Exposition to be held June 2-4.

Mr. Sam Burgess, Chairman of the Membership Committee, gave a brief outline of the growth of the Chapter since its inception, and reported the Chapter had taken in twelve new members since the first of the year.

Mr. F. W. Burgie, Chief Engineer of the Doehler Die Casting Company, was introduced as a guest. Chairman Ehrhardt then turned the meeting over to Mr. Bob Haines, Speaker's Chairman, who introduced Mr. William A. Hart, Chief Engineer of the Colonial Broach Company, Detroit, Michigan, as the speaker of the evening. Mr. Hart spoke on the subject of "Broaching and Broaching Machines."

The meeting adjourned to the auditorium and Mr. Hart presented his subject in a most interesting manner through the use of pictures. Starting with pictures of the first primitive type of broaches, the problem of joining gears onto a shaft by means of a keyway, the first types of belt driven broaching machines, the pictures illustrated the development of broaching machines through their various stages, Mr. Hart explaining the various steps as the pictures were shown.

The construction of the various broaching machines was explained by Mr. Hart, illustrations also showing examples of the various types of work done on these machines. Numerous questions were asked Mr. Hart after his talk and a very interesting and instructive discussion resulted.

TWIN CITIES

P. A. Clark, Publicity Chairman
5513-13th Avenue, South, Minneapolis, Minn.

The regular monthly meeting of the Twin City Chapter, which was held June 15th at the Minnesota Union, U. of M., at 6:30 p.m. was featured by a talk given by Mr. W. K. Bailey of the Warner & Swasey Company on "Precision Manufacture and Telescope Design."

Mr. Bailey's lecture, which proved to be highly amusing as well as interesting, was followed by lively discussion, and he soon became involved in answering questions on Astronomy. He being a mere salesman as he prudently explained at the beginning, was hard put at times. One scientifically minded fellow went Einstein one better and brought up the subject of a fifth dimension. This closed the discussion after which Mr. Bailey described his company's re-tooling program which had become necessary in order to take advantage of the power which has been built into their present day turret lathes. This re-tooling meant the redesign of most of their line of tools and tool holders, etc., to make them strong enough to take modern feeds and speeds.

That interest in the A.S.T.E. is growing in St. Paul and Minneapolis is attested to by the increasing attendance at our meetings. Ninety-seven persons were present at the dinner, and twenty-three more arrived to hear the lecture. Let us hope that the membership committee takes full advantage of this interest.

Superfinisher

(Continued from page 11)

quickly in the finishing heads. For coolant a mixture of International Chemical Oil and Staroline spirits is used. Figure No. 4 shows a close up of the finishing heads in position on the crankshaft.

Safety in Tool Engineering

(Continued from page 13)

periodically test these tanks and this test should be a hydrostatic and not an air test.

All that has been said about providing room for the operators' hands on fixtures is equally true on dies. If it is necessary for the operator to place parts in the die, suitable tongs should be provided to handle the part, air ejectors should be installed to remove the part, stock feeding equipment should be used whenever possible, telescoping guards should be installed in front of the die, in fact, anything you can do to keep the operators' hands from between the dies, regardless of how unimportant it seems, is worthwhile doing.

On accident reports we occasionally read that an operator has injured his hands in turning over or turning around a cylinder block or other large parts. By a careful study of the sequence of operations when lining up the part the number of times required to turn a part over or around can be reduced to a minimum. Then to protect the operator, install a turnover fixture or turn tables where it is necessary to reposition a part for the next operation.

We have discussed various ways that safety can be engineered into machinery and equipment, but, if we do nct practice what we preach we will continue to bring in machinery and equipment that have hidden hazards. The men in the shop do not know that these dangers exist. They have accepted in good faith the equipment you have selected for them to work with believing it to be safe. Unless you have exhausted every means at your command to find out for yourself that the equipment is safe, before approving it for purchase, you will not be aware of these hazards until someone is injured. You may not discover the hidden dangers that exist until someone has been —killed.

Tool Engineers Not Yet Affiliated with the American Society of Tool Engineers

are cordially invited to communicate with New Chapters' Chairman, Roy T. Bramson, 2842 W. Grand Boulevard, Detroit, Michigan if interested in the formation of a local chapter of this rapidly growing engineering organization.

This Society now has twenty-two chapters in the major industrial centers of the country. There may not be a chapter in your community—if not, and you are interested—communicate with us for full details.

JULY CHAPTER MEETINGS

Chapter Meeting Announcements must be received on or before the 20th of preceding month to appear on this page. Members and friends of The Society contact Chapter Secretaries for meeting details if your announcement does not appear below.

BRIDGEPORT

Bridgeport Chapter No. 6 will have no meeting in July.

•

BUFFALO

Buffalo Chapter No. 10 will have no meetings until September.

Details of Buffalo Chapter's Annual Picnic in August will be announced later.

•

CHICAGO

Chicago Chapter No. 5 will have no technical meetings until September.

Chicago Chapter will hold a Golf Tournament, Aug. 6th.

•

CINCINNATI

Cincinnati Chapter No. 21 will hold its next meeting July 14th at Lodge & Shipley (Temperature Control Room).

Call L. L. Weber at Lodge & Shipley for further details.

•

DETROIT

Detroit Chapter GOLF TOURNAMENT and other entertainment July 16th

at
Rammler Golf Club
Utica Road
$1.25 each for golf or dinner ticket
Both for $2.25
PRIZES. BRING A GUEST.
Call A.S.T.E. Offices for full details.

•

MILWAUKEE

Milwaukee Chapter No. 4 will have no technical meetings until September.

•

NEW YORK - NEW JERSEY

New York - New Jersey Chapter No. 14 will have no meetings until September. See next issue for September Golf Tournament and Stag Outing.

•

PITTSBURGH

Pittsburgh Chapter No. 8 has no regular technical meetings scheduled until September 9th. See announcements elsewhere in this issue and also in next issue regarding Semi-Annual Board of Director's Meeting to be held in Pittsburgh October 14th and 15th.

•

ST. LOUIS

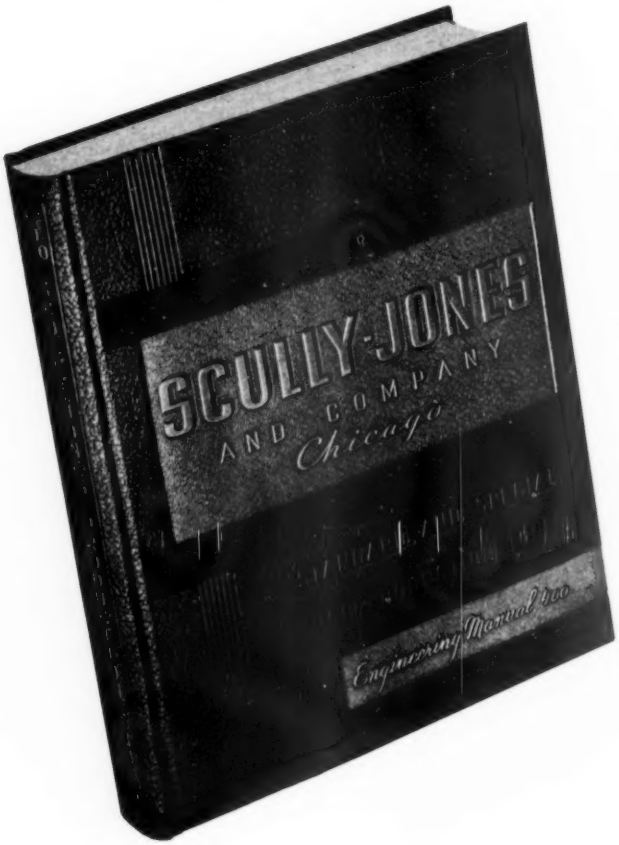
Chapter No. 17
July 23rd, 1938
1:00 p.m.
Laffler's Farm

First Annual Outing for members only with a few friends. Details by mail to St. Louis members and friends.

SCULLY-JONES ENGINEERING MANUAL EMBODIES MANY NEW FEATURES

Copies are available to production executives

A collet may be a "sleeve" to you, a "chuck" to someone else. The "Picture Index" in this Manual clarifies all such terms and definitions.



In addition there are many drawings, tables, data, etc., any Tool Engineer will want to have.

THE new No. 400 Scully-Jones Standard High Production Engineering Manual, illustrated on the front cover, embodies many new features; one of which is the Picture Index. This consists of eight pages of pictures clearly marked with the catalog name and style number of the tool as well as the page on which it is shown.

Many times a certain tool is known by one name in one division, while in a different division of the same plant another name is applied to the same tool. For example, a collet may be known to one person as a sleeve and to another as a chuck. By referring to this picture index the proper name will be ascertained and the tool located quickly from the picture shown.

Turning to the pages specified below the picture, complete information and dimensions will be found. A picture, line drawing and table covering the various sizes of this tool will be found on the same page. This does away with the necessity for cross references and enables the Tool Engineer to design his work without delay or loss of time.

This catalog is really a handbook of information on production tools. The book is substantially bound and opens flat on the desk.

Every key man on tools such as, planning, engineering, purchasing, etc., will find it useful.

Copies of this publication may be secured from your local Scully-Jones representative or by writing on your Company's letterhead direct to Scully-Jones and Company, 1903 South Rockwell Street, Chicago, Illinois.

JUST AS YOU'D EXPECT

in the aircraft industry, they check the planes, engines, parts and accessories with

STARRETT PRECISION TOOLS

and

DIAL INDICATORS

Checking tappet holes in a Wright Aero Engine Crankcase with a Starrett LAST WORD Dial Indicator and a Starrett Vernier Height Gage — Wright Aeronautical Corp., Paterson, N. J.

You'd expect to find Starrett Tools in the big aircraft and airplane engine shops . . . and sure enough you do . . . for Starrett Tools and Dial Indicators are standard equipment there just as they are in every industry that makes precision products. See the complete Starrett line fully described and illustrated in a brand new Starrett Catalog — No. 26 T. Write for your copy.

THE L. S. STARRETT CO., ATHOL, MASS., U. S. A.

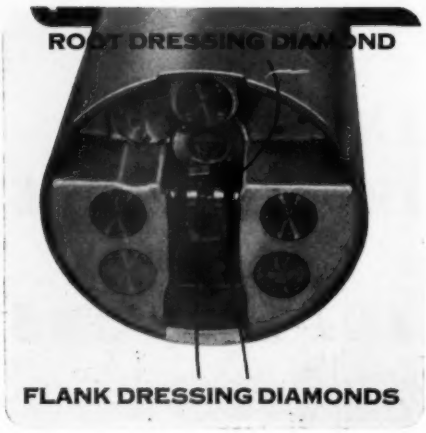
World's Greatest Toolmakers — Manufacturers of Hacksaws Unexcelled — Steel Tapes, Standard for Accuracy — Dial Indicators for Every Requirement

Standardize on

STARRETT TOOLS

BUY THROUGH YOUR DISTRIBUTOR

AUTOMATIC WHEEL DRESSING



AUTOMATIC WHEEL
TRUEING DEVICE

PRODUCTION GRINDING THE THREAD ON TRANSMISSION GEAR SHAFTS—COURTESY SPICER MANUFACTURING CORPORATION

JONES & LAMSON MACHINE COMPANY

MAKES PRECISION THREAD GRINDING *A Production Operation*

Thread grinding formerly was considered a precision process, too slow and costly for parts produced in quantities. Only the finest quality precision machinery; or laboratory instruments, where cost was of secondary importance; had ground threads.

This no longer is true. The J & L Automatic Thread Grinder, with its automatic wheel trueing and automatic sizing, brings thread grinding into the range of practical shop operations.

AUTOMATIC CONTROLS

With no attention from the operator and without disturbing the size adjustment to which the machine continuously is set, the wheel is kept true and sharp throughout its effective life. The wheel, therefore, is used as a stock-removing tool, as well as to produce a high quality of finish.

HIGH PRODUCTION

Metal is removed by a true cutting action in the form of tiny chips instead of dust. This high rate of metal removal is obtained without burning the work or sacrificing accuracy. Many parts can be ground from the solid with a consequent saving of time. Roughing and finishing operations are combined.

STANDARD CAPACITY

Threads 8″ in diameter with a maximum thread length of 18″ may be ground on any part of work 36″ long. The machine swings work of 11½″ diameter with a maximum worth length of 48″ between centers.

MANY KINDS OF WORK

For production parts, tools, and gages, the J & L Automatic Thread Grinder offers a new and better way to produce precision threads.

May we send further information?

A complete catalog will be sent on request

SPRINGFIELD, VERMONT, U. S. A.

HANDY ANDY'S ..WORKSHOP..

Like many of our A.S.T.Eers, I am a native of the high North; have seen the midnight sun roll over the hills, the slanting rays transforming the heather-ed hillsides into sheets of flame. And I have seen it rise in mid-forenoon, set in mid-afternoon, have been deafened by tempests whose force gave illusion of a world laid flat, and, have known silences so profound that the very stars seemed as audible as the whisper of the aurora. I have seen lakes so placid in the rose of twilight that the horizon was lost in the glow; by contrast, have seen vessels breasting the storm, their masts snapped and spars dragging. Yet, in those lands—for Scandinavia includes several states, embraces considerable territory—a people carry on, unperturbed and imperturbable, setting an example of peace, harmony and progress for the world.

▼ ▼ ▼

Now, this is not intended to be an eulogy of my people; such were an idle gesture. There is other purpose in the writing. For between this writing and date of issue, there will have been celebrated the tercentenary of the landing of the Swedes in Wilmington, Delaware. Not the first of the race to reach our shores, as you know, but the first to establish a permanent settlement. They built a church there, apparently intending that it stand forever, for the walls are three feet thick; it stands there today, serviceable, one of the oldest if not the oldest Protestant Church in America. The church is typical of the character of the founders; from that stock came signers of the Declaration of Independence, the first provisional President of the United States in Congress assembled, various men who have been a force in the creation of our country. That racial stock pioneered the great northwest, turned a wilderness into a golden empire, as it has contributed, considerably, to the social, civic and economic progress of America.

▼ ▼ ▼

Sweden was the first of the old world nations to recognize the new Republic, the first to sign treaties for commerce and amity and, from their signing, there has been unbroken peace and accord between the Scandinavias and America. Between these nations no sword has been unsheathed; adjustments, such as they have been, have been effected by a stroke of the pen. We—myself and my racial kin—feel rather pleased that this should be so.

▼ ▼ ▼

The American press has written in laudible terms of my people, and naturally, we take a pardonable pride—we are grateful, rather—for this expression of good will. For, in a world torn by suspicion and strife, with alien propagandists seeking to impose their Isms upon us, with democracy embattled against a rising tide of radicalism, the North has charted a steadfast course along the Middle Way, has created and built instead of destroyed. So you see, this is really an anniversary—nay, a tercentenary! — message of good will from a minority in the A.S.T.E. to their fellows. May the harmony and good fellowship that has prevailed between us just grow and grow that, mutually, we weld this A.S.T.E. into the greatest engineering society in the land, just as, mutually, we have worked to weld this nation into the greatest land on earth. Skoal!

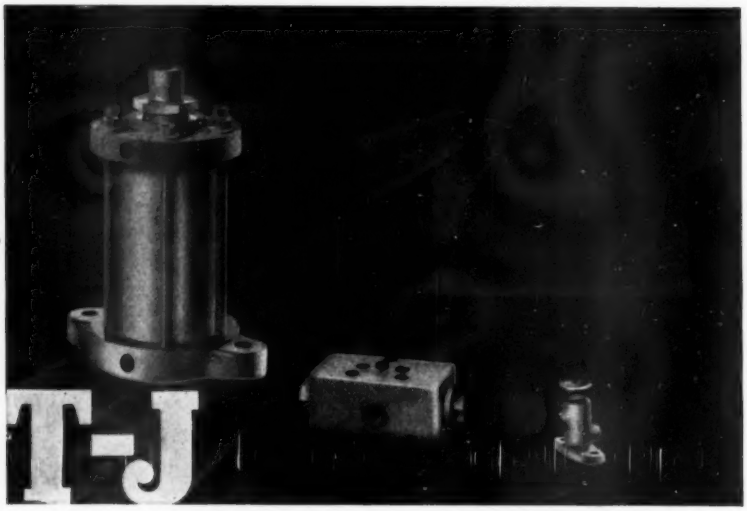
▼ ▼ ▼

Among a flood of editorial comment on the anniversary of King Gustaf of Sweden, the "Detroit Times" referred to it as his eighteenth birthday. Well, an octogenarian who sets a stiff pace in tennis can't exactly be over the hill, but perhaps the "Times" writer may have wondered what made him that way. "Backward, turn backward, oh time in thy flight."

▼ ▼ ▼

You know, one of the finest gifts I can think of is the ability to remember names, to reconcile names and faces. Because of erratic hearing (it was Bob Street who said he wished I either heard better or not so good) I have trouble hearing introductions, especially in a hum of conversation. But a face, that I never forget; the trouble is, I may forget where I first saw it, and whether or not I was introduced to the owner. For instance, I might have seen

(Continued on page 28)



REMOTE CONTROLS

You See Here the Three Primary Units in this pneumatic control system which apply on your presses or other machines for pneumatic push button operation. They secure maximum possible machine speeds while safeguarding workers. They remove manual effort from the machine operation.

The POWER CYLINDER attaches to clutch, trip or other actuating element. It is actuated by the power valve.

The POWER VALVE controls the application of air pressure to the cylinder to start and stop the machine movements. It is actuated by one or more of the button valves.

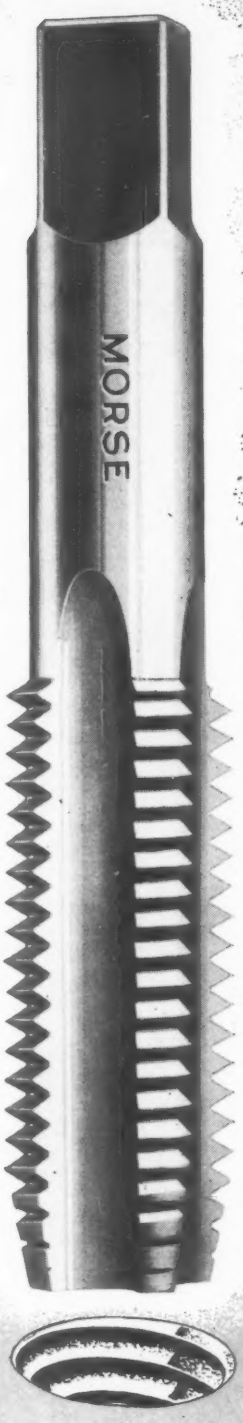
We have prepared detailed information (Bulletin No. 3) so that you can see how the equipment may meet your needs. May we mail it to you?

The BUTTON VALVE controls supply of pressure to the power valve, serves as the actuating medium for the system. It is available in all required designs for simple or complex interlocking control, for hand, foot, cam or lever operation, singly or in multiple; can be located in any desired position.

THE TOMKINS—JOHNSON CO.

624 N. Mechanic Street **Jackson, Michigan**

European Representative—Gaston E. Marbaix, Ltd., London



INDUSTRY ASSEMBLES
THE MAJORITY OF ITS PRODUCTS WITH THE HELP OF CLEAN, SHARP THREADS . . . TO KEEP TAPPING OPERATIONS AT MAXIMUM EFFICIENCY, SPECIFY MORSE . .

MORSE

THERE IS A DIFFERENCE

TWIST DRILL AND MACHINE COMPANY
NEW BEDFORD, MASS., U. S. A.

NEW YORK STORE: 130 LAFAYETTE ST. - - - - CHICAGO STORE: 570 WEST RANDOLPH ST.

HANDY ANDY'S WORKSHOP

(Continued from page 26)

a man on a train in Oklahoma, then, meeting him in Jersey, wonder whether to extend the glad hand or await a sign of recognition. With women I take no chances; they either make the first sign or I don the wooden mask. You never can tell whether you saw 'em in church or across the footlights.

▼ ▼ ▼

In going over the editorial matter for this issue (which doesn't mean that it will be printed this issue, but sometime) two articles stood out, one because of its precision, its nicety of language and meticulous attention to detail, the other because of its humanness. The last was an article by Jay Bowen*—a forerunner of many, I hope—which delighted me because the writing was so typical of the author, and because the sketches expressed such surety, such authority of subject matter. (By the way, Jay, ink 'em next time, will you?—and that goes for everybody. You can't make cuts from pencil sketches.) A sketch, properly executed, often portrays a device far more clearly than a formal drawing, and Jay's sketches are masterly. Look 'em over.

▼ ▼ ▼

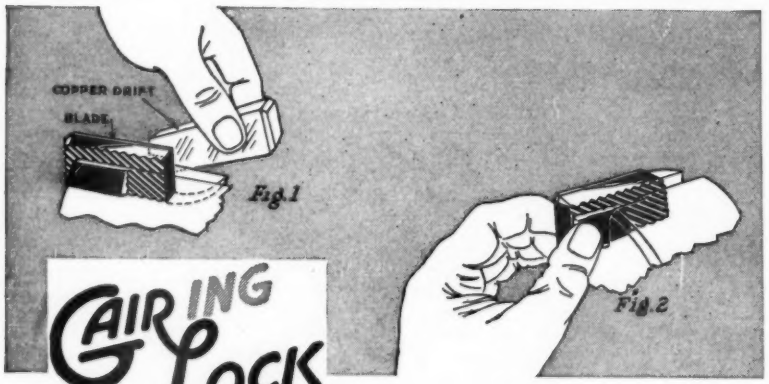
The article itself is unusual because of its keen description and narrative style, is highly instructive in its informality. And that bears out what I have been saying right along, that out of this group of Tool Engineers that make up this A.S.T.E. one could acquire a wealth of information on pertinent subjects, if only the boys would write it down and send it in. Style of writing isn't so important; it's what you have to say that counts. Write it down!

▼ ▼ ▼

Somehow, I feel that "The Tool Engineer" is going on toward better and bigger things. This year, for instance, we have some high powered help, for which we are duly grateful, hoping that it will give us more time to get around to A.S.T.E. doings. Especially, I want to take in the golf tournament, never having played the game and wondering whether to run after hitting the ball or ride a bike the way "John D." used to do. Anyway, I'm going to hit it, even if I have to go all the way through to China. I used to be good with a shinny stick (lowbrow for hockey) and was a wow at peggy. Ever play it? You take a stick, about 1" x 4", sharpen it both ends, lay it on the ground, hit one end, then sock it when it bounces up. I forget how it went after that, only, you don't yell "Fore!" And that'll be all for now; this is Father's Day and I'm laying off. I'll be seeing you. H. A.

* Mr. Bowen's article will appear in August issue.—Ed.

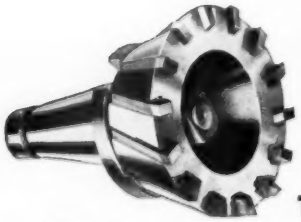
LESS "DOWN TIME"



GAIRING LOCK

Cutter Blades Easily Adjusted

FACE MILL



SHELL MILL

This radically new design makes adjustment and reconditioning of cutter blades in milling cutters and boring bars easy, simple and quick.

Blades are adjusted forward to increase diameter. To loosen, a light tap on a drift at the rear end of the blade and at the front end of Gair-Lock relieves the frictional contact of the lock and the blade (See Fig. 1) leaving them both loose in the blade slot. They are then withdrawn MANUALLY for adjustment - see Fig. 2.

The projection is made while the unit is out of the body by moving the Gair-Lock one or more increments toward the back of the blade before inserting back into the body.

No gage or setting ring is required to accomplish accurate, uniform adjustment. The tool is out of service for a minimum period. There are eleven other important Gair-Lock advantages. Ask for Bulletin 704.

The Gairing Tool Co., Detroit, Mich.

In Canada - Galt, Ontario

GAIR-LOCK BORING BARS AND MILLING CUTTERS -- SHELL, SIDE, FACE, INTERLOCKING, ALTERNATE TOOTH AND MULTIPLE DIAMETER

CENTERLESS INTERNAL GRINDING

(Continued on page 9)

The installation on these roller chain bushings and rolls has been a very successful one. The wear and tear on many of the larger sizes of roller chains is very severe and the least replacement of parts often requires shutting down a considerable amount of equipment at large expense. Grinding the rolls and bushings not only prolongs the life of the chain but it makes it much quieter and with more accurately machined parts the assembled chain has a more uniform pitch alignment.

Centerless internal grinding is also successfully handled on work with shoulders. Machines have been installed for bushings with a straight O. D. in one shoulder also with a taper O.D. and two shoulders. In both cases by simply relieving the roll to suit, the centerless handled them very satisfactorily.

On very thin work the centerless can be arranged to handle a number of pieces in a single load as illustrated in Figure 4. Here are 11 thrust bearings being ground at one time. The machine can also be arranged to grind blind holes. When grinding blind holes the Size-Matic method of sizing from the cross slide is used with a blade for supporting. An example of this particular job is universal joint bushings.

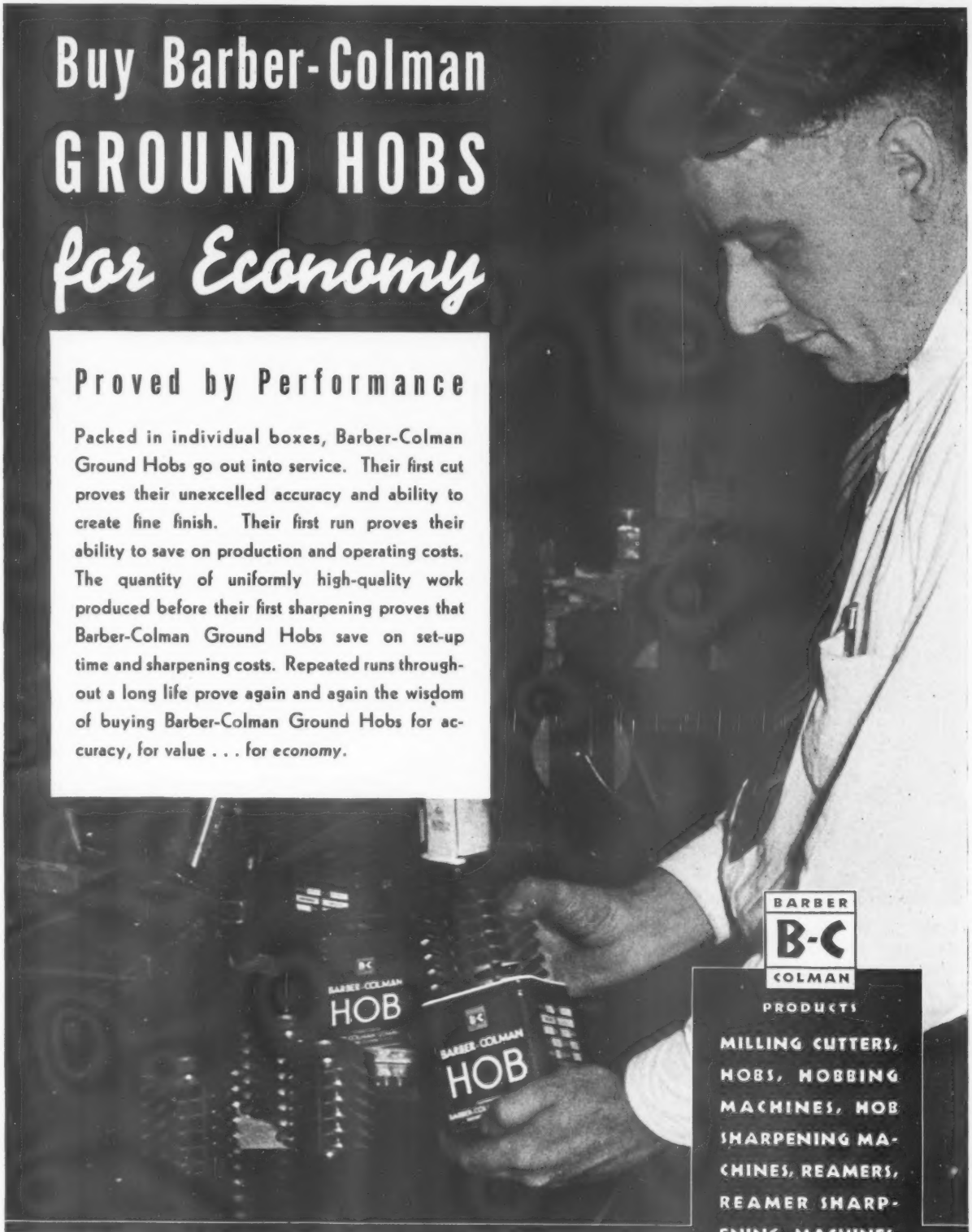
A very successful job that has been accomplished on the Centerless has been the grinding of the conical surface of valve seats which is the last operation before the seats are pressed in place and, therefore, must be held to very close limits as regards roundness and concentricity with the outside diameter. Figure 5 shows these valves in the chute while one is being ejected from the trough.

It is surprising how small work can be and still be handled successfully by the centerless manner. This is shown in Figure 6, where the machine is grinding Diesel engine roll bushings. Naturally, with this small work a blade is used for support instead of the roll.

For cylinders and long sleeves where close tolerances and perfect concentricity are required the centerless plan

(Continued on page 42)

Buy Barber-Colman GROUND HOBS *for Economy*



Proved by Performance

Packed in individual boxes, Barber-Colman Ground Hobs go out into service. Their first cut proves their unexcelled accuracy and ability to create fine finish. Their first run proves their ability to save on production and operating costs. The quantity of uniformly high-quality work produced before their first sharpening proves that Barber-Colman Ground Hobs save on set-up time and sharpening costs. Repeated runs throughout a long life prove again and again the wisdom of buying Barber-Colman Ground Hobs for accuracy, for value . . . for *economy*.

BARBER B-C COLMAN

PRODUCTS

MILLING CUTTERS, HOBS, HOBBING MACHINES, HOB SHARPENING MACHINES, REAMERS, REAMER SHARPENING MACHINES, SPECIAL TOOLS

BARBER-COLMAN COMPANY

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DETROIT, MICHIGAN
Hodges Machinery Company
544 New Center Building

MILWAUKEE, WISCONSIN
Dumser & Schroeder
610 West Michigan St.

NEW *Equipment*

Continental Band Filer

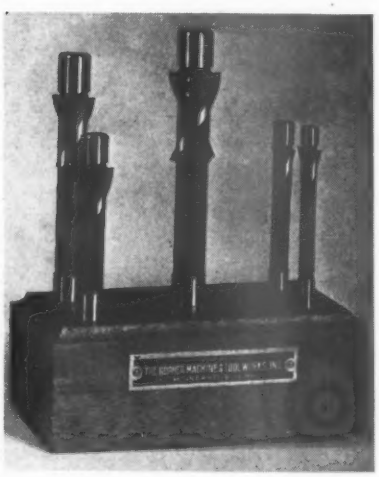
Continental Machines, Inc., manufacturers of the DO-ALL Combination Sawing-Filing-Polishing machines have just completed the Continental Band Filer. The file band is a Swedish flexible spring steel band on which are riveted short segments of special files. When the band flexes the file segments open, but close and interlock securely so as to form a continuous flow of rigid filing surface at the point of work. There is a narrow support behind the files at this point, so that great pressure can be exerted for rapid filing.

The new machine has a 12 inch work table, which tilts in two directions so that work may be filed at an angle. The machine is rugged enough for heavy filing and also built with careful precision to assure accuracy in close finish work. The housing completely encloses all working parts. Sealed ball bearings are employed throughout. The machine runs smoothly, it is claimed, and requires no lubrication. It is 32 inches high and weighs 150 pounds, thus making it portable and capable of being taken to any part of the shop and placed on any strong bench—or it may be ordered with a base at small additonal price. The Continental Band Filer is operated by any ¼ H.P. motor, which is mounted at the rear of the machine. Further detailed information may be secured by writing the company—Continental Machines, Inc., 1304 Washington Street, Minneapolis, Minn., and requesting bulletin No. T.E.—2.

Gopher Counterbore

Oftentimes a tool is developed, proven through use and so used without ever seeing the light of the outside world. Again, such a tool may be "discovered" with subsequent steps taken to make its inherent advantages available to other users. Such a tool, it is claimed, is the Gopher Toolroom Counterbore—developed for, and used exclusively in toolroom work over a period of fifteen years by the Gopher Machine and Tool Works of Minneapolis.

The primary objectives responsible for the design of this counterbore were a toolroom counterbore for standard socket head screws that would be, fast cutting, easy to sharpen, and of long life. The Gopher Counterbore's free or fast cutting action is due to its two-lipped construction and "quick lead" or spiral. Its rigidity and strength due to its one-piece construction with solid pilot make it possible to take advantage of its ability to "hog-out" the toughest of materials. With but two cutting lips to re-grind, plus the simple circular grinding job on the two spirals, sharpening is reduced to two easy and quick grinder set-ups.



The generous amount of "over-size" provided means many re-grindings may be had

(Continued on page 32)

PRECISION PAYS

YOU CAN CHARGE ONE "LOW COST" MISTAKE TO EXPERIENCE

DANLY DIE SETS AND DIE MAKERS' SUPPLIES
From the 8 Danly Branch Office Stocks

BRANCHES:
LONG ISLAND CITY, N. Y. 36-12 34th STREET
DETROIT, MICHIGAN 1549 TEMPLE AVENUE
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ROCHESTER, N. Y. 16 COMMERCIAL STREET
MILWAUKEE, WIS. 513 EAST BUFFALO STREET

Saving in the cost of die sets is one of the most expensive forms of tool room economy. Just a few more thousand pieces per regrinding more than pays for the extra value of the Precision Set. The cost of one production line tie-up, one die smashed would make up for a "precision appropriation" for an industrial lifetime.

Precision Pays. Shearing is the continual destroyer of die surfaces—offset it with the ±1/10,000" accuracy of Danly Precision Die Sets.

Precision Pays. Specify Danly Precision Die Sets and you have it.

DANLY MACHINE SPECIALTIES, Inc., 2114 So. 52nd Ave., Chicago, Ill.

DANLY PRECISION DIE SETS

STRENES METAL

THE LAST WORD IN DIE ALLOYS

If you use drawing and forming dies, read on, for you won't want to miss the amazing story about Strenes metal . . . the cast-to-shape alloy that continues to set new economy and performance records in field after field.

In the first place, Strenes dies are inexpensive. Not only is the metal itself comparatively low in price, but machining in many cases becomes unnecessary. A case in point is a grave vault end die . . . perfectly cast and requiring absolutely ***no*** machining. We don't claim this for all dies of Strenes metal, but it does show what is being done.

In the second place Strenes dies have unbelievable resistance to wear. An example is a refrigerator top die set calling for a 3" double-cornered draw out of .050 material. This die has produced more than ¾ million stampings and is still in excellent condition.

In the third place, Strenes dies are exceptionally low in upkeep. They don't gaul and "pick-up", making stoning and polishing operation very infrequent . . . only 1/3 to 1/6 as often as with ordinary dies.

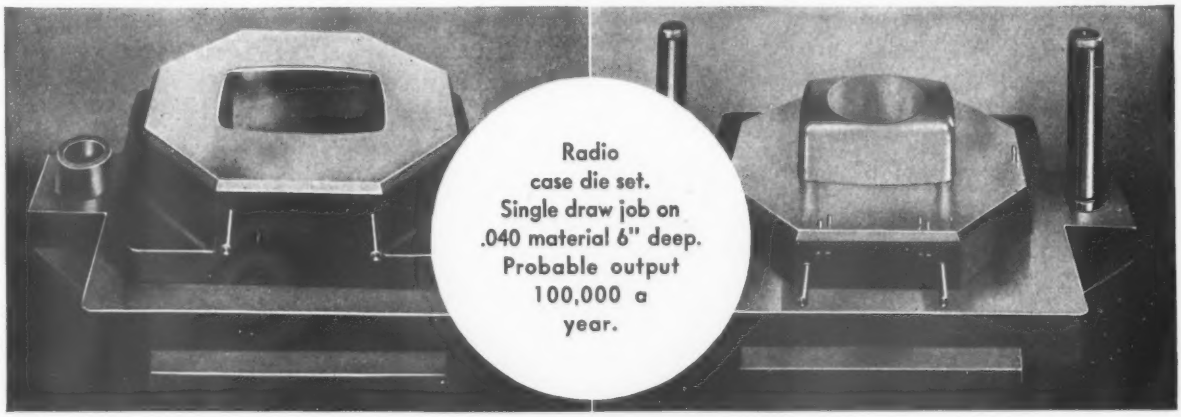
LONGER WEAR **STRENES** AND NO REPAIR

What gives Strenes metal such characteristics? The answer lies in its secret formula, which enables us to combine ***all*** desirable properties in one alloy. And we might add that, despite constant attempts at imitation, only Strenes gives the perfect combination.

For your information, Strenes is a chrome, nickel, molybdenum alloy with a high steel base. 50,000 minimum tensile. Can be heat-treated to a hardness of 525 to 550 Brinell or 55 Rockwell C. 4,000 transverse. .23 deflection. Makes a long run, close grained, high strength alloy casting. Takes a high polish. Gives excellent graphitic surface lubrication, especially noticable on difficult draws.

Cast your next drawing and forming dies of Strenes metal. You can't fail to get REAL results. THE ADVANCE FOUNDRY CO., Dayton, Ohio.

Representatives: W. R. McDonough & Co., National Bldg., Cleveland, Ohio • F. W. Peterson, 7310 Woodward Ave., Detroit, Michigan
Fred H. McGee, 917 Carter St., Chattanooga, Tennessee • Gilbert T. Osborne, 6037 Park Ave., Indianapolis, Ind.



Radio case die set. Single draw job on .040 material 6" deep. Probable output 100,000 a year.

NEW EQUIPMENT

(Continued from page 30)

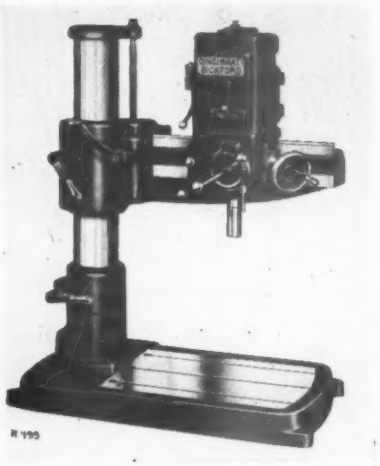
before the counterbore is reduced to substandard dimensions.

An inquiry addressed to the manufacturer, The Gopher Machine and Tool Works, 51 Royalston Avenue, Minneapolis, Minn., will bring a chart of interest to Tool Engineers; the chart, in addition to illustrating the Gopher Toolroom Counterbore, contains tables of spindle speeds for counterboring various diameters in several materials, and of punch and die clearances for different thicknesses of a variety of materials.

New 2½' High Speed Super Service Radial Drill with 7½" Diameter Column

This new addition to the Cincinnati Bickford line of Super-Service Radial Drills was developed especially for manufacturers whose work includes much small drilling and tapping in fairly large parts—work now being handled on large upright drills or on less efficient belt driven radials of the sensitive type. This is a high-speed, all-geared, small radial drill adaptable to the production line. Three changes of spindle speed are controlled by the upper lever at the left of the head. With a 1200 r.p.m driving motor (A.C. or D.C.) the speeds can be any one of several optional ranges. Should it at any time be desirable to change the speeds to any of the other specified ranges, it is merely necessary to lift the aluminum cover from the top of the head and replace two pick-off gears.

Six spindle speeds can be obtained by using a 2-speed A.C. motor instead of the constant speed type. The 2-speed motor is controlled by a convenient Fast-Slow-Stop switch mounted at the right of the head. Adaptability and a wide range of usefulness is thus obtained.



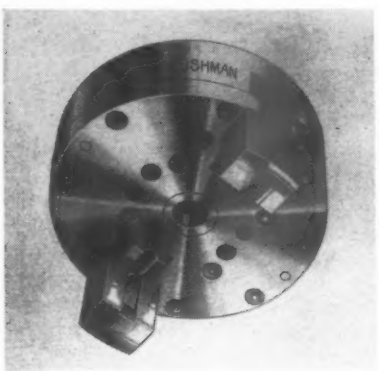
The versatility and economy of these simplified radials makes them ideally suited for plants engaged in producing automotive and aircraft parts, agricultural machines, electrical devices, tools, military equipment, business machines, and the like.

Further details may be had by addressing the Cincinnati Bickford Tool Company, Cincinnati, Ohio, mentioning "The Tool Engineer."

New Cushman Precision 2-Jaw Chuck

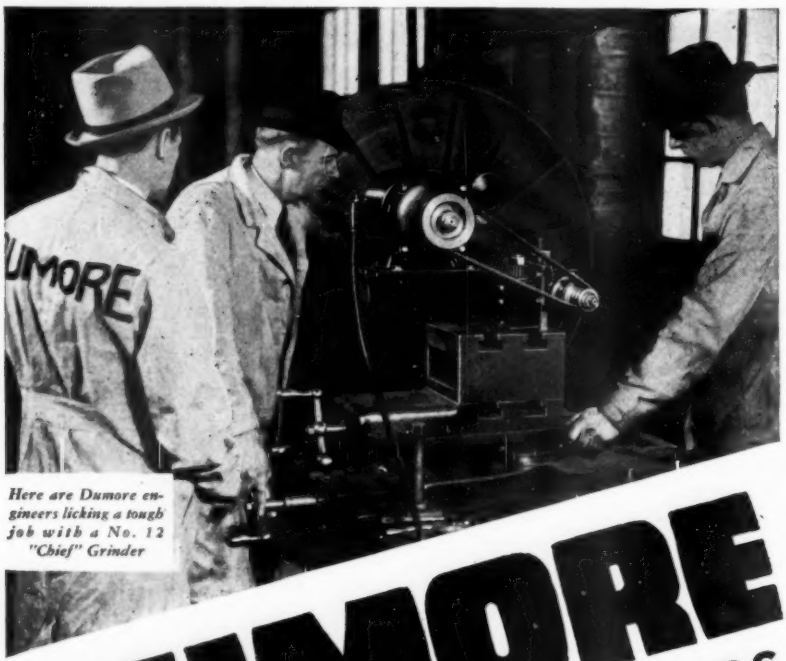
A new Cushman 2-jaw chuck of the precision type provides a degree of accuracy in centering work pieces that heretofore has not been available, and incorporates important advantages over chucks of conventional design for production jobs.

Unusual features include a one piece steel body with hardened steel face in which the jaws are enclosed. The hardened alloy steel operating screw is held by the self-aligning thrust bearing which completely encircles the neck of the screw and assures accurate alignment with the mating teeth of the master jaws. Jaws themselves have wide bearing surfaces in place of the conventional rib design, thus providing locating surfaces of such area that inaccuracy due to wear is eliminated. Furthermore, the jaws are supported in the center, under the hardened steel face, to prevent danger of bell-mouthing.



Master jaws are of the American Standard design and the soft top jaws when at-

(Continued on page 34)



Here are Dumore engineers licking a tough job with a No. 12 "Chief" Grinder

DUMORE

HELPS LICK THE TOUGH JOBS

In the toolroom . . . the birthplace of time-saving, cost-cutting methods . . . and on countless exacting production jobs, Dumore grinders have been the means . . . and Dumore factory men have brought the methods . . . to crowd costs down and push production up. Whether you now own grinding equipment or not, it will pay you well to be familiar with the latest Dumore developments. A quarter-century of constant contact with manufacturing problems that daily become more complex . . . has equipped Dumore engineers to take tough grinding jobs in stride and lick them as a matter of routine. The experience and cooperation of these men are constantly at your command . . . without obligation. Write today for your copy of the 1938 Dumore catalog.

THE DUMORE CO. Dept. 228-C Racine, Wisconsin

This $6.50 CARBOLOY TOOL

Paid for itself

In the first 8 hours of use

Finish facing aluminum crankcase cover contact for small aviation motor.

Face must be within .002" of flat. Intermitent cuts add to severity of service required from Carboloy Tools.

. . . is now paying a PROFIT DIVIDEND of 6% every 28 minutes . . .

. . . on this basis will produce an estimated saving of $1394.50 during its life

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Carboloy Co., Inc., 2983 E. Jefferson Ave., Detroit, Mich.
How *fast*, and how *much* additional machining profit can we make with Carboloy Tools?

_____

Name_____ Title_____

Company_____

City_____ State_____

NEW EQUIPMENT

(Continued from page 32)

tached form a seal on the hardened body face thus completely enclosing all operating parts of the chuck. This new chuck is available in a full range of sizes for direct mounting to American Standard spindles and can be easily attached to the threaded type of spindle nose by means of an intermediate plate.

Address inquiries to Cushman Chuck Co., Hartford, Connecticut. Mention "The Tool Engineer."

Universal Adjustable Collet Chucks

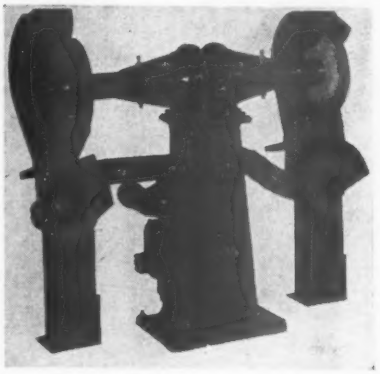
The Universal Engineering Company, Frankenmuth, Michigan, announces an Adjustable Collet Chuck, especially adapted for holding drills and reamers for both hand and automatic screw machines. The important feature of this chuck is that it can be adjusted to align the tool with the spindle, compensating for any wear in the turret slides. The chucks are provided with keys so that the flanges can be set at right angles to the turret slide simplifying the correct setting of the tools. Should adjustment be necessary in two directions the keys can be removed. The collets are the same type as have been used in the Universal collet chucks for holding end mills, woodruff keyway cutters and center points. A longtitudinal adjustment of the drill itself can be made through the collet and the drill can be set to any length desired. This chuck will hold the drill even though it is gripped on the flutes. In many instances it is not necessary to cut off new drills where only short projection of cutting flute is required. Another feature of this collet is that it does not mar the shanks and in this way cause misalignment.

When writing for details mention "The Tool Engineer."

New "Standard" Exhauster Equipment

The Standard Electrical Tool Company, 1933 West 8th Street, Cincinnati, Ohio, announce that the design of their Pedestal Type Buffing and Polishing Machines in sizes from 1 to 20 HP permits the attaching of Exhauster Equipment to the back of the pedestal. This same unit may be attached to any make of Grinding, Buffing and Polishing Machines.

The illustration below covers the 2 HP Pedestal Type Buffing and Polishing Machine available at 1750 or 3450 RPM. The Buffing Motor is controlled by a Magnetic Starter located inside the base and connected with a Push Button Station at front of the motor.



The Exhaust Blower is powered by a 3600 RPM Ball Bearing Motor, the motor and blower being mounted on a common base and attached to the back of the pedestal. The Blower Motor is controlled by a separate Push Button Manual Starter at front of the pedestal and this starter provides over load protection. If preferred the extra starter may be eliminated by having the Blower Motor and Buffer Motor connected so that the two units operate simultaneously through the Magnetic Starter located inside the base.

The unit is furnished complete as illustrated including the Adjustable Hoods and necessary piping. There is an Air Filtering Stand available for connecting to the Exhaust Blower. This Stand is located in back of the machine and collects all refuse while the air leaves the Stand perfectly clean. An arrangement of this kind permits the collection of dust and refuse from grinding, buffing and polishing equipment when location is remote to the regular exhausting system.

New Hammond Grinder

The Hammond Machinery Builders of Kalamazoo, Michigan announce a new series of Wide Swing Grinders to their Line.

2 or 3 H.P. machines are included, but this series also includes machines up to 7½ H.P. On the 2 and 3 H.P. machines, wheels are spaced 30" centers and spindle is 41" long overall.

In the design of these Grinders particular attention has been given to maximum space around the wheels to provide working space for the handling of bulky pieces.

On these Wide Swing Machines Totally Enclosed Motors are used, bearings are sealed against the entrance of abrasive matter, and shatter proof eye shields and magnetic starter with overload and low voltage protection are supplied.

Write to the Hammond Machinery Builders, Kalamazoo, Michigan, for full details, mentioning "The Tool Engineer."

New 48-page illustrated booklet entitled "The Story of Sulphurized Cutting Oils" now available to personnel of metal working plants. Please write to 2727 South Troy Street, Chicago, for your free copy using company letterhead and stating authority.

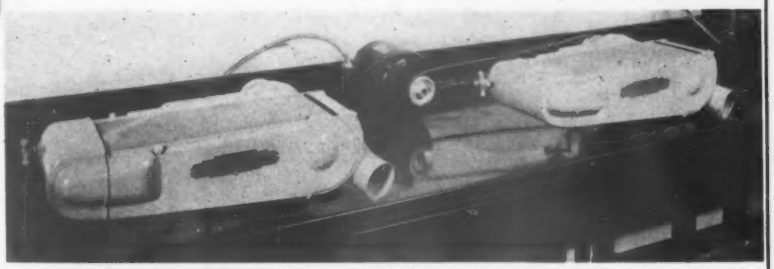
How Reynolds Cuts FINISHING COSTS

In the new and up-to-date Reynolds Molded Plastics plant at Cambridge you will naturally find Delta belt sanders specified for the Finishing Department. Naturally, because they have found that "the use of these machines is very advantageous because they can be shifted around to make different combinations as used in progressive line production." But that is only half the story. Delta sanders are low in first cost, but are engineered to stand up and take it in production. They are completely enclosed, so they practically eliminate hazards in operation. They are as nearly dustless as a sander can be made. They require no lubrication and practically no maintenance.

Delta Sanders Offer You:

- **Reduced Costs**
- **Increased Safety**
- **High Production**
- **Minimum Dust**
- **Low Maintenance**
- **Wide Adaptability**

Delta Sanders can be used either vertically, as above, or horizontally, as at the right. They are adaptable to a wide range of small-parts finishing, either in metals or plastics or a combination of the two. You do not realize how efficient a modern sander can be until you have investigated this machine. Write today for complete details and prices.



Two of the Delta belt sanders installed at the Cambridge plant of Reynolds Molded Plastics, ready for connection to blower system.

DELTA MANUFACTURING CO.

639 E. Vienna Ave. Milwaukee, Wis.

Q-C ENGINEERING

EFFICIENT ECONOMICAL TOOLING

Is always secured through the use of "Q-C" Standardized Products —

FIXTURE LOCKS
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Q-C designed and built fixture for core drilling and chamfering ports. Inlet manifolds, two sizes.

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DESIGNERS - BUILDERS

DIES, JIGS, FIXTURES AND SPECIAL MACHINERY **STANDARDIZED PRODUCTS**

GENERAL PURPOSE GRINDERS

(Continued from page 14)

work. This position is definitely fixed, with no possibility of the handle being jarred into starting its downward path, because the pivot point at the left hand end of the lever comes to rest just beyond the centerline of the dash-pot at the left.

This semi-automatic device, which automatically grinds and sizes the work, permits the operator to dog the work while the machine is operating, thereby eliminating a non-productive operation which, in many cases, constitutes a large portion of the time required to complete the job.

Figures 2 and 3 show the Hinged Internal Grinding Attachment for the standard Cincinnati 12" and 16" Universal Grinding machines. In Figure 2, the attachment is swung up and out of the way for external grinding, while in Fig. 3 the attachment is in the conventional internal grinding position. As can be seen by comparing these two illustrations, this attachment has a big advantage in precision grinding parts in which the O.D. and I.D. must be exactly concentric, because the part remains in the machine for both grinding operations. Therein lies its advantage as a production tool, although the machine itself is highly versatile. The very fact that the attachment increases this versatility permits the single throw crank shaft shown in the machine (a production job for an aircraft engine) to be finished in one setting, thereby eliminating one work handling and one machine setting. While the machine is equipped with raising blocks, a special back rest and a center rest, and a special pull-back air chuck, the internal attachment is of principal interest in this discussion.

The attachment is individually driven by a 2 h.p. motor mounted on a plate which replaces the standard cover plate immediately above the spindle. A flat belt transmits the power from the motor to the pulley on the internal spindle. This belt may be left in place while the attachment is not in use, as it merely hangs loose on the two pulleys. The spindle housing is hinged on anti-friction bearings at the front end of the motor mounting plate. When swung down to the grinding position, a single hinged bolt clamps the spindle housing to a finished pad on the grinding wheel head. This design forms a very rigid mounting, permitting rapid stock removal and helping to produce high grade finishes. When not in use, a heavy spring on the left hand side of the attachment holds it in the up position. This spring counteracts the weight of the attachment, making it easy to swing the unit up or down. Any one of seven different quills may be assembled into the spindle housing, allowing the use of wheels ranging from ¼" to 2" in diameter.

The internal spindle housing is cored out to incorporate an oil reservoir. Lubrication is automatic, continuous and visible.

Accuracy of alignment is an important feature of the design of this attachment. Since it is not necessary to swivel the grinding wheel head for an internal operation, or to remove and replace the attachment, it is always in exact alignment with the centerline of the grinding wheel spindle. The advantage of this arrangement is apparent when one considers the operation of dressing the internal wheel. It is necessary merely to dress the wheel a sufficient amount to true it up on the periphery, and never to dress off excessive amounts to compensate for misalignments. The prime importance of alignment, wherein the O.D. and the I.D. of the part are ground at one setting, as the crank shaft job illustrated, is hardly necessary to mention.

These two examples of versatile, general purpose center-type grinding machines disprove the usual contention that standard general purpose machine tools are profitable only in tool rooms or for small quantity lots. Hundreds of other examples of Cincinnati equipment could be cited. As in these two cases, many of them consist of the standard machine, plus an attachment which in no way limits the machine to one operation, and we have a machine tool which is the equal of special, single purpose equipment.

CONTINENTAL

★BAND FILER

BRAND NEW . . . and

only $88.00

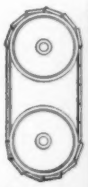
● Just think of this—a really efficient continuous filing machine at a sensationally low price! For faster, better, smoother work on all metals, alloys, plastics, fiber, wood, etc.

The file segments automatically interlock and form a rigid file before they reach the work. Filing is in one direction only, prolonging file life and producing an exceptional job.

13 standard file bands are available for best work on various materials, from toughest high carbon steel to copper, brass, etc.

It's sturdy. Weighs 150 pounds. Portable. Place on any work bench. 32" high.

Operated by any ¼ HP motor (not included).



See how the File Band works.

Every machine shop, model and tool room, and metal worker can save time and money with this remarkable performance machine.

Get a demonstration from your dealer or order on 10-days Free Trial. Circular on request.

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☐ Send Continental Filer on 10 Days Trial.

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TE-7

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Why Force Your Men to waste time on machine tool set-ups when CAD Standardized appliances will convert this non-productive time into productive time into productive labor? ***Why Rut. Machine Table Slots*** with ordinary bolts when CAD Bolts are designed to fit T slots? The CAD Bolt is a standard machine table bolt; made of steel with full smooth threads; slot size and requires no machining; ready for use when you receive it. ***Our Illustrated Folder A 56 is full of valuable information. Send for it today!***

STANDARD SHOP EQUIPMENT CO., *Set-up appliances for machine tools*

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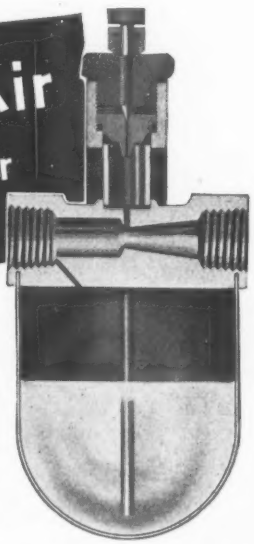
Oiled Air
a tonic for your tools!



Oiled air gives zip to air tools—keeps them running sweetly. With a Norgren Sight Feed Automatic Lubricator on the air line, the tool is given a measured, regulated amount of lubricant in the air that drives it. The tool works smoothly, remains in perfect condition even when not in use. This method of lubrication saves lubricant, costs less for labor, requires minimum attention, eliminates a lot of "down time."

No installation ever made has been taken out! Sizes range from ¼ in. to 1½ in., prices $5.00 to $27.50. Two styles, horizontal and vertical. We'll ship on the order of any rated company, allow 30 days' trial, accept return of shipment if customer is willing to operate without it!

Descriptive circular on request.

C. A. NORGREN CO., INC.

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GAMMONS OF *Manchester*

PRODUCTION TOOLS

ORIGINATORS AND MANUFACTURERS OF HELICAL FLUTED TAPER PIN REAMERS

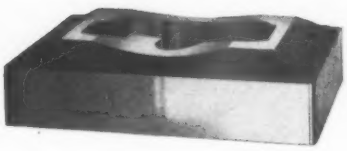
THE GAMMONS-HOLMAN CO., MANCHESTER, CONNECTICUT

LOWER COST DIE AND TEMPLATE WORK

Baker Contour Grinder meets todays demand for production of better dies at lower cost because (1) Table is fully accessible and size of work is not limited by obstructions. (2) Without change, the machine handles internal or external grinding. (3) Complete visibility allows operator to follow template or scribed line. (4) Easily controlled vertical reciprocation increases life of wheel and increases cutting efficiency.

Write today for Contour Grinder folder containing full description and details. Baker Brothers, Inc., Toledo, Ohio.

BAKER ★



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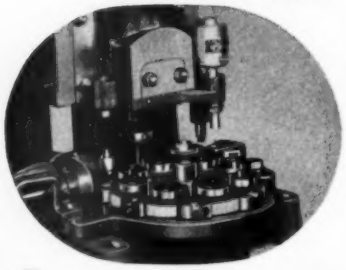
THOMAS AUTOMATIC DIAL FEEDS



5 sizes for any press

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THOMAS Automatic Dial Feeds are made in five sizes, suitable for mounting on any type of crankshaft-operated power press. Economical to install. (Illustration shows parts being blanked and grinding operation being performed simultaneously.)

Send us samples of parts or sketches of your press requirements for feeding equipment suggestions. No obligation. Write for Catalog 212 describing complete Thomas Press line.

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MACHINE MANUFACTURING COMPANY

Name changed from Thomas Spacing Machine Co.
PITTSBURGH, PA.

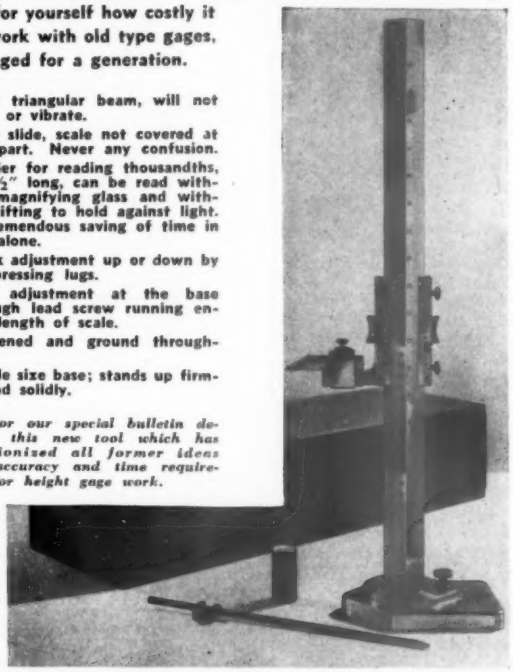
FABRICATING MACHINERY

A Striking Advance *in* Height Gage Design

Consider the points of construction enumerated below and judge for yourself how costly it is to work with old type gages, unchanged for a generation.

1. **Rigid triangular beam, will not sway or vibrate.**
2. **Open slide, scale not covered at any part. Never any confusion.**
3. **Vernier for reading thousandths, is 2½" long, can be read without magnifying glass and without lifting to hold against light. A tremendous saving of time in this alone.**
4. **Quick adjustment up or down by compressing lugs.**
5. **Fine adjustment at the base through lead screw running entire length of scale.**
6. **Hardened and ground throughout.**
7. **Ample size base; stands up firmly and solidly.**

Write for our special bulletin describing this new tool which has revolutionized all former ideas about accuracy and time requirements for height gage work.



GEORGE SCHERR CO., 124 LAFAYETTE ST., NEW YORK, N. Y.

TRADE O K MARK

TEE SLOT BOLTS

FOR USE ON PLANERS, BORING MILLS, MILLING MACHINES OR OTHER MACHINES WITH SLOTTED TABLES

THESE bolts are manufactured in the same factory as the well-known "O. K. System of Inserted-Blade Metal Cutting Tools," and with the same relative care. They are forged of special medium carbon steel, heat treated for maximum toughness. The heads are milled accurately to size. With each bolt is furnished an O. K. nut of special design, in which nut and washer are incorporated into one unit. Having nut and washer integral eliminates time which is often wasted trying to keep tabs on separate washers. This flanged nut is made of the same tough steel as the bolt itself.

"O. K." Tee Slot Bolts may be obtained in any length, from 2" long to 24". A circular completely describing and pricing the line will be sent you on request.

THE O. K. TOOL CO.,
Shelton, Conn.

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Standardized Drill Jig Bushings

Prompt delivery from stock on over 10,900 standard items—over 6700 ACME Standard—over 4200 A. S. A. Standard—all completely finished ready for use. *Special sizes made to order.*

Made in our new plant by the most exacting and scientific methods—insuring accurate fit plus long wear—concentric within .0003" full indicator reading.

Send for bulletin containing complete data and low prices. Satisfactory service guaranteed.

Also manufacturers of complete machine parts, specializing in **hardened and ground** parts requiring **extremely close limits, lapped fits, etc;** also **hydraulic appliances** for pressures up to **20,000 lbs.** per square inch.

ACME INDUSTRIAL CO. 208 N. LAFLIN ST. CHICAGO, ILL.

UNIVERSAL TEST INDICATORS

Have you seen the new slide clamp that facilitates setting the indicator? Ask to see it.

MODEL ONE
Graduated 1/1000"
Range . . . .030"

MODEL TWO
Graduated 1/10,000"
Range . . . .008"

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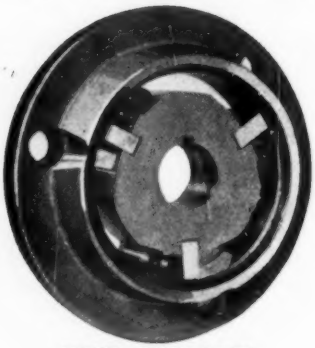

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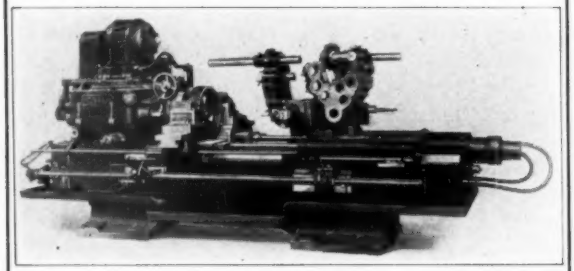

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These automatic turret lathes are rapidly replacing hand operated machines.

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Get Foster production figures before buying.

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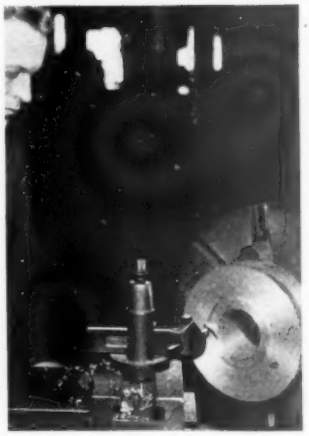

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New Literature

of Interest to the Tool Engineer

Davis Boring Tool Company Issues Three New Engineering Bulletins

Davis Boring Tool Company, 6203 Maple Avenue, St. Louis, Missouri, has recently issued three new engineering bulletins, titled (1) "Silent Engineer." This bulletin, composed entirely of blue prints of tools taken from the Davis files of tools which are actually in operation in various plants throughout the country, shows the wide range of boring tools which Davis is capable of manufacturing. It illustrates many new applications of the Davis Tools which should be of much interest to Tool Engineers and tool designers in every industry. Request Bulletin No. 200. (2) "Block Type Boring Equipment." This bulletin is a revision of the Davis Bulletin No. 100, which illustrates and describes the Block Type Boring Tool Material, showing new prices and containing much more engineering data for the Tool Engineer than has ever been published before on this particular equipment. Ask for Davis Bulletin No. 300. (3) "Super Micrometer Fly Cutter Tool." This bulletin illustrates and describes the new Davis Tool which is perhaps the greatest single advancement in Boring Tools in the past twenty-five years. It is a single point boring tool which adjusts accurately to .00025 on diameter. This tool not only expands accurately but also contracts just as minutely. Complete price data is given in this bulletin as well as engineering data which will assist in designing and laying out tools for many particular jobs at hand. Request Davis Bulletin No. 500. All of these bulletins are attractively illustrated and of standard size 8½ x 11 punched for a three binder for convenience in filing.

Landis Bulletins

Three new bulletins have just been issued by the Landis Tool Company, Waynesboro, Pa. Landis Bulletin No. N-138 describes the Landis 10 inch type D Hydraulic Crank Pin Grinder. This is the first catalog published by the Landis Tool Company applying to the machines in question and undoubtedly contains much information of specific interest to the Tool Engineer. The Landis Bulletin No. N-38 describes the Landis 16 inch Type D Hydraulic Crank Pin Grinder, is profusely illustrated and gives considerable engineering data, as well as specifications. The Landis Bulletin No. L-38 covers the new Landis 3 inch Type C Hyrdaulic Chucking Grinder and gives complete engineering data as well as specifications. Copies of these bulletins are available free on request direct to the Landis Tool Company, Waynesboro, Pa., Dept. T-E.

New Condensed Textbook on Cutting Oils

D. A. Stuart Oil Co. is offering to engineers and executives of metal working plants a new 48 page copyrighted publication entitled "The Story of Sulphurized Cutting Oils."

This new booklet features the scientific application of cutting fluids on metals of different analyses and is well illustrated throughout, an original type of cutting oil application chart proving of particular interest.

Some of the subjects discussed editorially are the following:

Cutting Oil Progress.

Cutting Oil Research.

Fundamental Types of Sulphurized Cutting Oils.

Evaluating Cutting Oils on Laboratory EP Testing Machines.

When to Use High or Low Added Sulphur Content in Cutting and Deep Drawing Oils.

The Color of Sulphurized Oils.

The Modern Method of Cutting Oil Application.

A complimentary copy of this publication—practically a condensed practical textbook on machine tool lubrication—will be mailed to personnel of metal working plants with rating of foreman or higher. Requests to be addressed to D. A. Stuart Oil Co., 2727 South Troy Street, Chicago, Illinois, U.S.A.

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CENTERLESS INTERNAL GRINDING

(Continued from page 28)

has been incorporated in a workhead on a Heald No. 73 Internal. Here, as can be seen in Figure 7, there is a similarity with the regulating, pressure and supporting rolls. The No. 73, however, is usually furnished as a plain machine with a direct reading dial indicator for size. Also the work is loaded and unloaded manually instead of automatically. This is accomplished by a hand lever and toggle arrangement that lifts the pressure roll while the work is being loaded from the rear. This makes a very simple method for loading long, large work. The rolls are adjustable and can be made to suit work with varying diameters. This particular job is a liner sleeve for an airplane engine cylinder.

Although a large part of the work which centerless internal grinders have been installed for has been mass production and, therefore, the machines have been automatic, The Heald Machine Company have recently brought out a hand loaded centerless internal where the work is of such character as to require manual loading. Or where it is necessary to turn the work end for end such as Diesel engine barrels the bore being so small that it is impractical to grind straight through.

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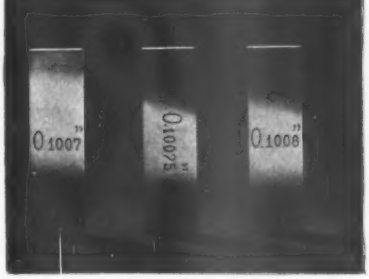

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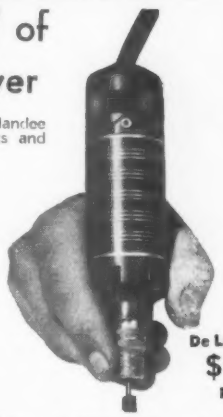

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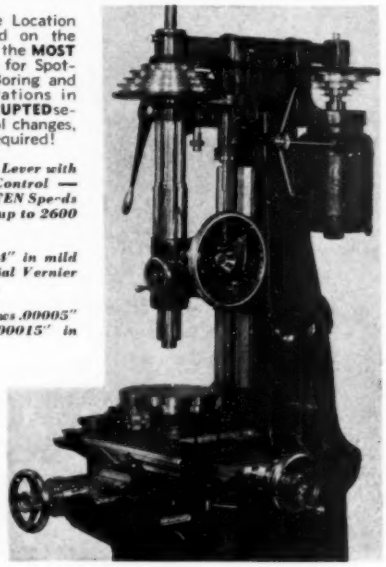

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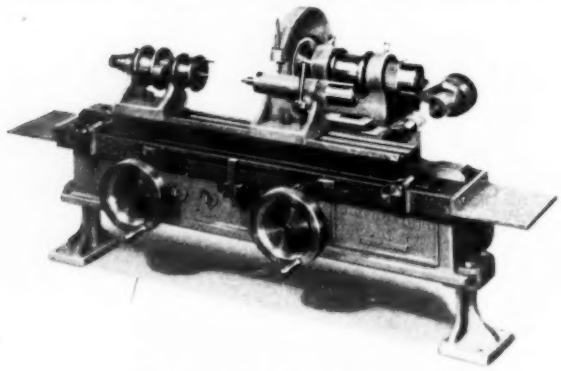

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Pittsburgh Chapter A.S.T.E., will be host to a two day semi-annual membership meeting which will be devoted to numerous plant inspection tours in "The Workshop of the World"—Pittsburgh's great industrial center. Members will have the opportunity to visit the steel, aluminum, plate-glass and electrical industries as well as some of the finest industrial laboratories in the world.

The William Penn Hotel will be the headquarters for the technical sessions as well as the National Board of Directors' meeting. An elaborate banquet will be one of the high lights of the gathering with a speaker of national importance who will deliver the address of the evening.

J. R. Weaver, past chairman of the Pittsburgh Chapter and now Vice-President of the A.S.T.E., is in charge of arrangements. Plenty of activities for members who attend this meeting have been arranged—from the football game between Carnegie Tech and Holy Cross to a golf tournament, etc.

See the next issue of "The Tool Engineer" for further information about the technical sessions and the many industries to be visited.

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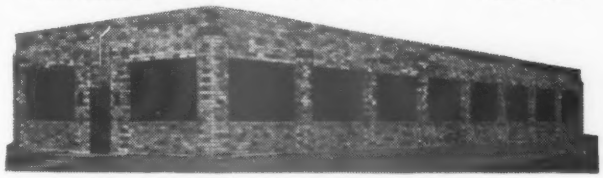

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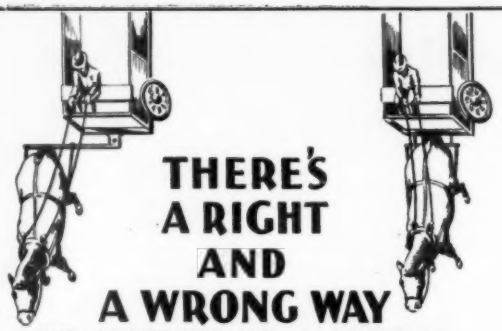

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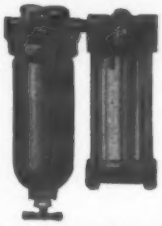

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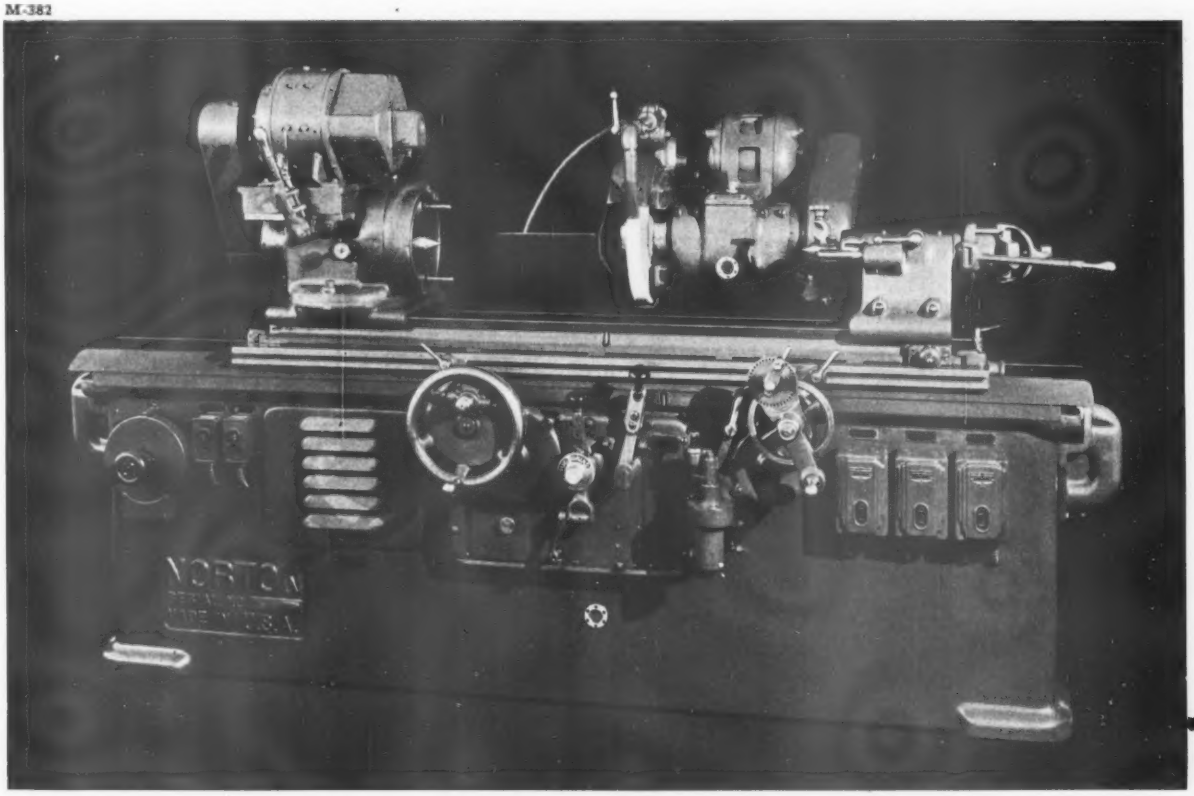
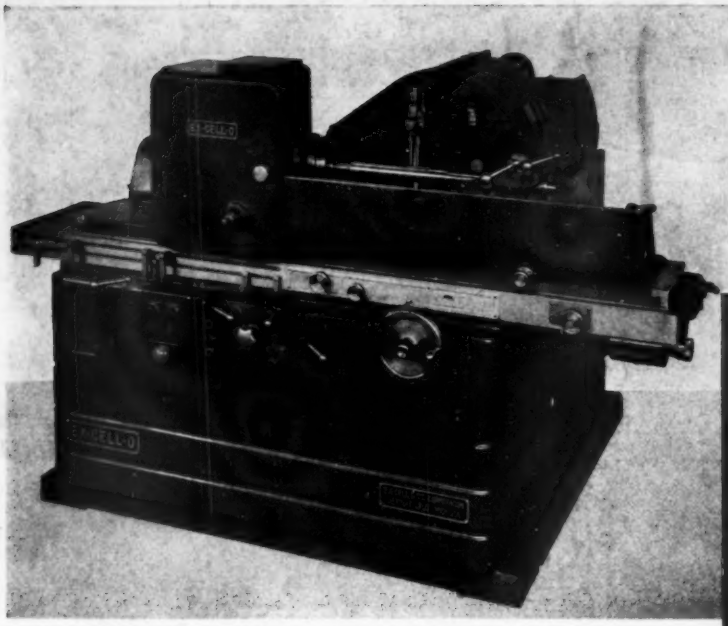
M-382





Universal Precision Thread Grinder, Ex-Cell-O Style No. 35. Self-contained, hydraulically operated and controlled, oil coolant type machine. (For high production runs on externally threaded parts of smaller size, Ex-Cell-O also offers a Style No. 31 Grinder.)

WIDE WORK RANGE *Combined with* HIGH PRODUCTIVITY

Without attachments, the Ex-Cell-O Style No. 35 Thread Grinder will produce these accurate threads: right and left hand; straight and tapered; with any pitch from 1 to 40 per inch; in U. S. Standard, sharp "V", 29 degree Acme, and modified Buttress thread forms.

This machine will produce most standard threads directly from solid, hardened blanks on a production basis; distortion caused by the heat treatment of previously rough cut threads will be corrected by finish thread grinding. Threads up to 12" in diameter, 22" long, can be ground on work up to 33" between centers. Longer shafts, up to 1⅝" in diameter, are inserted in the hollow work spindle. With an attachment, internal threads can be ground on work from 1" to 8" inside diameter.

No other production threading method compares with grinding after hardening for accuracy of form, size and lead. Yet, such accurate threads are produced on the Ex-Cell-O Universal Precision Thread Grinder at a cost often lower than less precise methods.

FEATURES of OPERATION

● **WILL AUTOMATICALLY GRIND** to a predetermined size and then stop feeding, or stop at either end of table travel. Cross feed can be automatic or hand controlled. You grind in both directions, and automatically reverse at each end while still in the cut—without having an undercut at the end of the thread. An hydraulically operated backlash compensator is built in this machine.

● **HYDRAULICALLY OPERATED**, infinitely variable work speed spindle, not limited by steps, enables the maximum work speed to be used on each job—materially increasing the daily production from this Grinder.

● **THERE IS NO END PLAY** in the heavy duty grinding wheel spindle, because it runs in closely fitted Ex-Cell-O Precision Ball Bearings. The wheel is rapidly dressed, at grinding speed, semi-automatically. This aids in maintaining accurate thread form.

● **ACCURATE GRINDING** on a production basis under normal shop temperature change conditions, is made possible by a built-in lead compensator. Odd jobs with special leads, such as metric and diametral pitch, can also be ground.

● **PROVISION FOR GRINDING TAPERS** up to 2" per foot is built in.

● **INTERNAL ATTACHMENT**, easily installed on machines in the field, permits handling internally threaded parts. An external backoff attachment, also easily installed, enables the machine to grind straight and spiral fluted taps, chasers, etc.

EX-CELL-O

DRILL JIG BUSHINGS. GRINDING SPINDLES. HYDRAULIC POWER UNITS. PRECISION BORING AND FACING MACHINES. PRECISION THREAD GRINDERS. COUNTERBORES. BROACHES. CARBIDE TOOL GRINDERS. CARBOLOY TIPPED TOOLS. SPECIAL HIGH PRODUCTION MACHINES. GROUND FORM TOOLS. PRECISION PARTS. MILLING CUTTERS

EX-CELL-O CORPORATION • 1204 Oakman Blvd., Detroit, Mich.

Please send me, without obligation, your latest catalog on Precision Thread Grinders (Also, on the products I have checked at the left).

Name_____ Title_____

Company_____

Address_____